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ENVIRONMENTAL IMPACT REPORT

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ALBANY WATERFRONT

ENVIRONMENTAL IMPACT REPORT

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CONTENTS

SUMMARY

1. SUMMARY

A. PROJECT

The City of Albany proposes to develop its waterfront for public and commercial recreation use in accordance with the master plan described in VOLUME 1. That plan would convert the existing Albany landfill into a fully developed complex containing a marina, commercial facilities, and extensive park improvements. Construction is planned in four phases to begin in 1978 and end in 1982.

B. IMPACTS

A project of this scale and complexity will have a number of impacts upon its immediate surroundings and upon the broader community. Many of the impacts, particularly those affecting the Bay, have already occurred as a result of the existing landfill. Sediment deposits are gradually enlarging sandy beaches along the south edge of the landfill and developing mudflat-marsh areas along its north edge. Installation of the marina enclosure and breakwater will add to this sediment deposition.

Further filling of the Bay, as proposed for the marina dikes and breakwater, will destroy Bay-bottom flora and fauna, although this impact is not deemed significant at this location.

During construction, there will be some on-site disruption from noise and traffic, but the site is quite isolated and traffic need not traverse City streets.

Energy will be consumed both for construction and operation of the facilities.

C. MITIGATION

Improvements to the site itself - such as sealing and capping - will greatly benefit local water quality in the Bay, and the unique tidal basin will help to flush nutrients and pollutants out of the marina enclosure.

The increased shoreline of the proposed development plus the installation of select concrete rubble to protect the slopes, will expand the habitat for rocky shore invertebrates which will then support a greater fish and bird population in the area. Landscaping the site will provide improved habitat for terrestrial wildlife while significantly improving the appearance of the site.

When in operation, the project will generate sufficient revenues to amortize the loans and bonds by which it is to be financed, and a substantial surplus will be available for other purposes, such as accomplishing the ULTIMATE development.

The project will provide employment both for construction and operation of the improvements.

Last, but not least, the project will afford a variety of opportunities by which the public can enjoy unique marine-related recreation, and most of these will be available without charge.

INTRODUCTION

2. INTRODUCTION

This Environmental Impact Report is an evaluation of the proposed development of the Albany Waterfront as described in the companion VOLUME 1 report entitled ALBANY WATERFRONT - PLANNING AND FEASIBILITY STUDY.

VOLUME 1 begins with a thorough description of the project augmented by precise graphic illustrations of all aspects of what is proposed. That is followed by a discussion of engineering considerations, a detailed examination of construction costs and phasing, and an in-depth financial analysis of the development proposal. Also included as appendices to VOLUME 1 are the Geotechnical Study and a report on Sedimentation.

Much of the information fundamental to this Environmental Impact Report is contained in VOLUME 1. To minimize repetition, material covered in VOLUME 1 is not duplicated in this volume, although, where necessary, pertinent subject matter is referred to or briefly outlined. To fully understand and evaluate the proposed development, VOLUME 1 and VOLUME 2 should be considered as one document and both should be reviewed.

PROJECT DESCRIPTION

3. PROJECT DESCRIPTION

A. GENERAL

The master plan for the Albany Waterfront defines how the entire City shoreline is proposed to be developed. However, the area which the plan covers is divided into two parts. The INITIAL development, on which the feasibility study focuses, is limited to land and submerged tidelands currently (or recommended to be) under ownership or control of the City (Plates 2, 4 and 11). Development of that area - consisting essentially of the large bulb at the westerly end of the landfill, parcels proposed for acquisition, and the right-of-way extention of Buchanan Street - is the project under consideration. Except for the portions of the regional trail extending north to Richmond, development of the balance of the shoreline, which is designated as ULTIMATE on the plan, would take place on land which is currently in private ownership.

The landfill which is to serve as the project site is actually only a limited part of a much more extensive fill which was proposed in the Albany Isles Plan. The existing land mass which was created by the deposit of primarily construction rubble and earth poses a number of serious physical problems which have to be overcome before development of the site can take place.

A number of public agencies are in a position to directly or indirectly influence what can be done at this site. The history of the City's relationships with those agencies, especially concerning the controversial landfill project site, is outlined in VOLUME 1. Section 8 of this volume describes the contacts with the staffs of those agencies which took place during the planning process.

B. OBJECTIVES

The Waterfront Committee, composed of Albany citizens appointed by the City Council, formulated a set of clearly defined goals and objectives which served as the design criteria for facility planning (Vol. 1, p. 14 - 17). As the master plan took form and the feasibility of the project was being studied, there were many meetings between the consultants and the Waterfront Committee to report on progress, to review problems, and to receive further input.

In essence, the master plan which evolved is aimed at converting the present unaesthetic and unsound landfill into an attractive well-designed complex of facilities offering a variety of marine-oriented public recreation uses. Towards that end, the physical plan was carefully integrated with a detailed fiscal program, with the goal of designing improvements which could be accomplished without undue financial burden on the City. A balanced program for implementing the plan - both physically and financially - developed as an integral component of the master plan.

C. THE SITE

The site of the proposed project is the landfill which was placed beginning in 1963 and which projects into San Francisco Bay from the northwesterly portion of Golden Gate Fields. The characteristics and constraints of this unique landform permeated all of the basic design decisions for the project. They are thoroughly covered in VOLUME 1 and in Section 4 of this volume.

The existing landfill has obviously already had a significant impact upon the environment and shall continue to do so regardless of the nature of the proposed development. Also, as indicated in VOLUME 1, a number of important protective measures remain to be carried out on the landfill before it can be closed down as a fill operation, and

these modifications are required even if no development were to take place.

D. THE PROJECT

The development proposed for the Albany Waterfront is best illustrated on Plate 4 of VOLUME 1, but is further explained by the other graphic plates and the descriptive text (Vol. 1, p. 18-32). The INITIAL project under consideration consists of a marina, related commercial facilities, and public park areas. A fishing pier, a launching ramp, a tidal basin, trails, parking areas, and other ancillary facilities are also part of the proposed development.

It is envisioned that the INITIAL development will be constructed in four annual phases, extending from 1978 until 1982. Limited use of the site will begin upon completion of the first phase, and will progressively increase as additional facilities are built.

The most significant impacts upon the environment will derive from: the necessary modifications to the existing landfill mentioned above; the initial dredging; the creation of an enclosed harbor by building the new dikes and breakwater; the installation of structures and landscaping; and the opening of the site to public use.

ENVIRONMENTAL CONSIDERATIONS

4. ENVIRONMENTAL CONSIDERATIONS

A. GEOLOGIC

1. Existing Geologic Conditions: The study area encompasses all of the Albany Waterfront from Richmond to Berkeley with particular emphasis on the relatively recently created landfill which forms the project site. This area is part of the eastern edge of the central portion of San Francisco Bay.

> *San Francisco Bay has been described as the drowned river valley of the ancestral Sacramento River (J. Schlocker, 1974). The San Francisco Bay trough was formed by faulting and folding, and the Bay Area as we know it today took upon much of its physiographic detail in mid-to-late Pleistocene times, or about one million years ago (Goldman, 1967).*
>
> *Throughout Pleistocene and modern times the Bay has been nearly filled with sediments from both marine and local upland sources. Modern bay muds were derived from sediments deposited following the release of melt waters of the Wisconsan glacial period and from sediments carried into the Bay by the Sacramento-San Joaquin River and from local drainage features. The quantities of sediments carried into and deposited within it have resulted in a shallow bay with depths in the central part averaging less than 30 feet. Deeper sections are generally represented by older submerged river channels, such as the Golden Gate channel, which has a depth of 340 feet (Goldman, 1967).*
>
> *Immediately north, south, and east of the project site sedimentary and meta-sedimentary rocks of the Franciscan Assemblage are exposed (Armstrong, 1973). Where exposed, the sandstone and shale of the Franciscan Assemblage forms topographic high points such as the knolls of Albany Hill and the hill on which Golden Gate Fields is situated. The Franciscan Assemblage is also the basement rock underlying the bay sediments and the alluvial plain landward.*

The bay sediments have been divided into younger and older bay muds and sand deposits by Goldman (1967). The engineering properties of the younger and older bay muds vary significantly in such properties as support, consolidation, and seismic ground response.

The "north shoreline" of the Albany Waterfront is a low-lying area that parallels Hoffman Boulevard and stretches from the Richmond City limits southward for about 3,500 feet to Buchanan Street. The area above high tide generally is less than 100 feet in width and narrows to approximately 20 feet near the beginning of the Albany interchange. Bay mud underlies the shoreline and its thickness is estimated to be approximately 10 to 15 feet at the shore, decreasing in thickness to the east. Man-made fill has been placed along much of the shoreline but its thickness is unknown.

The northern half of this shoreline contains some marsh grasses extending westward into the mud flats. The southern half of the shoreline has little vegetation and the intertidal zone is partially protected by rock riprap. Ice plant (Carpobrotus edulis) partially covers the area between the shoreline and the freeway right-of-way.

There are several small drainage outlets along the shoreline which have eroded minor channels through the soft mud flats. At the extreme southern edge of this shoreline is a 60-inch diameter reinforced concrete storm drain pipe, flanked on both sides by 24-inch storm drain outlets (SWR, 1975 - pp. 24, 25).

The "southern shoreline" of the waterfront from the landfill site southward for approximately 700 feet consists of a sandy gravelly beach with rock riprap within and above the intertidal zone. Shoreward of this is a parking area for Golden Gate Fields, portions of which consist of fill over bay mud; the thickness of the fill and mud layers is unknown. Foundations placed on properly compacted fill over bay mud are not expected to pose significant problems in this area.

Two piers are located at the south end of the beach, each one at the end of a 100-foot, man-made spit. These piers are both in an advanced state of disrepair. From the small beach southward for approximately 1,500 feet the shoreline is rocky and rises steeply to the

upper parking lots of Golden Gate Fields (Fleming Point). *The steep bluffs are potentially unstable.*

The remainder of the shoreline southward from the natural bluffs to the Berkeley City limits is a man-made riprapped beach. Immediately inland is an access road for the stable complex of the race track. This area probably consists of from 5 to 10 feet of fill over 15 to 20 feet of bay mud which decreases in thickness to the east. There are no significant engineering constraints to the development of this portion of the shoreline (SWR, 1975 - p. 27).

The "central shoreline" of the waterfront consists of the Albany landfill which was placed at the north end of Golden Gate Fields, extending westerly into the Bay from the edge of the parking lot for about two thirds of a mile. In addition to previous investigations performed as part of the Phase 1 SWR study, Woodward-Clyde Consultants proposed a preliminary Geotechnical Study of this area (Vol. 1, Appendix 1) concentrating on the western end of the landfill where the INITIAL development is proposed. Except where noted otherwise, that report is the source of the following discussion.

In placing the fill material, the operator generally repeated the same procedure. An enclosed cell was formed by constructing dikes composed of broken concrete rubble, soil and some slag from a nearby steel plant. The cell was then filled with wood, building demolition debris and soil. While this interior filling was going on, more of the select material was being used to form dikes for another adjacent cell (Vol. 1, Appendix 1, Fig. 1). It was intended that the landfill developed in this way would eventually conform to the configuration of the Albany Isles Plan.

Since filling into open Bay waters was stopped in the early 1970's, filling has been confined principally to the top of previously filled areas, so that in some locations the fill has risen to a height of

as much as 35 feet above mean sea level. The westerly dikes which enclose an unfilled cell are low and are experiencing some wave overtopping and erosion.

In general, the landfill is flat topped with steep side slopes, many of of which are as steep as 1.7 horizontal to 1 vertical. Although there is no apparent evidence of past major slide instability, the present high steep slopes have relatively low factors of safety against static slope failure - perhaps as low as 1.1 or 1.2. The southerly slopes, which were apparently intended as final slopes, contain a great deal of concrete rubble and are fairly strong. However, the westerly slopes which were to have additional fill placed against them are less resistant. The northeasterly slope is a permanent slope and is much flatter than the westerly slopes.

Test borings performed by Harding-Lawson (Phase 1) and Woodward-Clyde Consultants revealed that the fill is resting on a few feet of coarse sand (a possible crust) which rapidly grades into soft silty Bay Mud varying in thickness from about 30 to 65 feet. Beneath the Bay Mud are stiff silty clays and dense clayey silts and sands, with some lenses of stiff old Bay Muds. These sandy and clayey soils are the competent bearing soils for foundations at the site.

It appears that settlement of the landfill to date has been about 2 to 3 feet, and has resulted primarily from consolidation in the Bay Mud. Settlement across the site has been reasonably similar, with the weight of different densities of material offset by differences in height of fill. Settlements due to Bay Mud subsidence in the next 10 to 20 years might reasonably be expected to be in the order of 1 to 3 feet. However, because of the nature of the mixed material in the fill, settlement is likely to be erratic from place to place.

There are no recognized soil series within the confines of the project area. The landfill is a heterogeneous mixture of soil and weathered rock

from a variety of geologic sources with a large percentage of construction debris, mainly rock, brick, concrete, and wood. Some hard industrial slag, localized occurrence of dredged bay mud, and such refuse as tires, appliances, metal objects, and paper can also be found in the landfill.

From the viewpoint of selection of landscaping plant materials, there appear to be no constraining edaphic factors in the main part of the landfill. The major factors influencing plant materials selection should be high winds and salt spray. Phytotoxic methane gas production from decomposition of wood and plant debris is a possibility which will require further investigation. If found to be a problem on-site, special measures for landscape plantings will have to be developed (SWR, 1975 - p. 28).

2. Geologic Impacts: Changes which are anticipated to the landform and geologic condition of the existing landfill fall into two broad categories. First, there are the significant modifications which will result from the work required merely to finish off the landfill in a satisfactory manner. Second, there are all of the other site additions and refinements necessary to develop the site for the proposed uses.

The first category of changes to be made are those required to meet the health and safety standards of several regulatory agencies. In essence these consist of: buttressing the slopes to minimize the risk of collapse from seismic activity or mud failure; protection of all slopes from erosion by wave action or rainwater; sealing of the slopes to preclude fluid transmission; capping the top of the fill to prevent release of gases or penetration of water; and shaping of the entire site to provide drainage. These changes, referred to as interim protective measures, are all necessary.

Although they obviously will have both short-term and long-term beneficial effects, the interim protective measures will require the placement of about 2.5 acres of fill in open water around the westerly bulb of

the landfill and about 1.0 acre within the existing lagoon. The geologic consultants recommend that there be no cutting or excavation into existing slopes because of the dense rubble, gas and leachate which may be exposed. Slope stability should be achieved instead through flattening the effective slopes by filling over the toes. To achieve this, a low buttress dike of concrete rubble is to be placed well outboard of all toes to act as a counterberm and as riprap protection. These concrete rubble counterberms are to be no steeper than 2 horizontal to 1 vertical on the water side and are to have a minimum height of +8 MSL (Sections 1, 4, 5 and 6, Plates 9 and 10).

Major geologic changes in the second category - those required to implement the public use of the site - involve filling to enclose the marina, dredging the harbor, shaping the land mass, and applying structures and surfacing to the final landform.

The fill required to build the dikes around the marina and the breakwater totals 7.3 acres. Pages 11 and 12 of the Geotechnical Study in Volume 1 and Sections 2 and 3 on Plate 9 describe how these enclosure elements are to be constructed, design grades to overcome high-tide wave runup, steps to prevent loss of the sealer fill, and compensatory measures to offset mud subsidence. The choice of concrete rubble and earth for the harbor dikes and breakwater as opposed to using sheet piling is discussed later in the section on Alternatives.

Construction dredging is proposed for the entire harbor and for the area between the entrance and the breakwater (Plates 11 and 12). This is to provide adequate depth for keeled sailboats and added storage for anticipated siltation. Dredging will be to a depth of about -12 MSL, about 3 to 4 feet below the existing mudline. Slopes at the toe of the dikes are to be no steeper than 4 horizontal to 1 vertical. It is estimated that about 122,000 cubic yards of material will be taken out during this initial dredging for the harbor and between the entrance and the breakwater. All dredging will be by clamshell and the spoils will be placed between the parallel concrete rubble dikes

forming the enclosure arms to develop a low permeability sealing soil (Sections 2 and 3, Plate 9). Most of the construction spoils can be disposed of in this manner, and any excess would be spread in thin lifts on the northerly part of the landfill and on other areas not immediately scheduled for development. None of the initial construction dredge spoils will be disposed of in the Bay.

Plate 7 shows the proposed final grades for the project site with the master plan improvements located on the same drawing. Comparison with the existing grades shown on Plate 6 points up the rather limited modifications proposed for the landform. Roads will generally follow existing alignments and swales. Because of concern about fill stability, hills and mounds which will be introduced to enhance the site are limited to a maximum of 15 feet above existing grade. More refined grading plans will be required to fully define how surface water drainage is to be handled.

The nature of the existing landfill and the Bay Mud on which it rests is likely to generate from 1 to 3 feet of differential settlement throughout the site. This will cause particular construction and maintenance problems for structures, surfacing, roadways, and utilities. With adequate slope designed into the initial drainage plan, this gradual subsidence should result in minimum impact on open landscaped area.

3. Unavoidable Adverse Geologic Impacts: Implementation of this project will require special construction measures and higher-than-normal maintenance to cope with the problems anticipated as a result of settlement.

A major adverse impact will be the obliteration of existing open soil areas by the introduction of structures and surfacing for the lifetime of the man-made improvements.

Adverse impacts of a non-geologic nature which will result from site modifications - particularly those resulting from placing additional fill in the Bay - are discussed in other appropriate sections of this report.

4. Mitigation of Adverse Geologic Impacts: It is recommended that the entire site be capped with clayey fill material, to a depth of 3 feet in parking and building areas and 2 feet in all other areas. In the commercial area the site is to be put into a condition of moderate rebound by excavating to a level of approximately +21 or +23 MSL, then reworking the exposed existing fill by proof-rolling or recompaction, and then capping with 3 feet of well-compacted clayey fill.

Light one-story wood-frame structures can be supported directly on the clay cap. However, they will be subject to differential settlement and will require such features as jacks or wedges to permit releveling if the tilts become excessive for the structure's use. Such tilting is likely to be less than 1 foot in 40 to 50 feet. Releveling will probably be necessary every 1 to 2 years.

The large restaurant buildings will be on pile foundations to limit settlement to tolerable amounts. These piles will probably be 130 to 150 feet in length, and are recommended to be of prestressed concrete. The bottom of these structures will be above the finished grade, minimizing the effect of local differential settlement. Entrances will have articulating structural ramps spanning between the pile-supported building and an on-grade support.

Over the years, there will probably be undulation and settlement in paved areas. The proposed capping and compaction as recommended in the Geotechnical Study will help to minimize these changes. However, regular maintenance, repair and replacement will be required during the life of the project.

The existing landfill has many areas where the surface material would not support vegetation. As part of the project, all open unsurfaced areas will end up with a soil cap suitable for the landscape materials proposed.

5. Irreversible Geologic Impacts: The existing configuration of the site will be altered both horizontally and vertically and the installation of facilities will probably fix that new landform for a very long period of time.

B. SEDIMENTATION

1. Existing Sedimentation Conditions: Ray B. Krone, Ph.D. prepared a report in April 1976 called SEDIMENTATION AT THE PROPOSED ALBANY WATERFRONT & MARINA which is included as Appendix 2 of VOLUME 1. The following discussion is digested from that report.

Fine mineral particles which enter the Bay mainly between December and April are essentially products of erosion, with approximately 80% originating in the Central Valley. This material is about 60% clay, 30% silt, and 10% fine sand. Most of these sediments settle initially in the large shallow areas of Suisun and San Pablo Bays, with some carried directly to the ocean. From April to September, daily onshore breezes generate waves in the shallow areas that suspend newly deposited material and keep it suspended while slow tidal currents circulate it. This material settles when the breezes die at night.

Finer particles are transported further and coarser particles are left in wind-swept shallow areas where they form a thin armor that is resistant to erosion. Areas sheltered from the wind have soft mud bottoms. The shallow areas at Albany which are exposed to wave action show the armoring, with a crust capable of supporting a man.

Water depths in the vicinity of the site are greatest to the southwest and should remain unchanged after the marina is constructed. Because the slope of the offshore Albany area is relatively uniform, there do not appear to be any marked tendancies to create offshore sand bars.

2. Sedimentation Impacts: Any sediment deposit that occurs inside the berthing area will consist of fine Bay Mud. It is estimated that this will be at a rate of less than .01 foot per year (1 foot in 100 years). This rate of deposition - although calculated from limited data - would suggest that after the initial dredging, no maintenance dredging will be required inside the harbor in the forseeable future.

The area between the breakwater and the harbor entrance will be relatively free of wave action and sand will accumulate in this location. However, this should occur at a rate no greater than behind the Berkeley breakwater, which suggests that limited dredging will be required in this area every four to six years.

The Albany landfill interrups the littoral sand transport which moves northerly along the shore of Golden Gate Fields. A sandy beach is already developing at the corner formed by the fill and Golden Gate Fields and it will continue to grow out into the Bay as more material is deposited.

The open cell north of the proposed tidal basin will experience shoaling, particularly in the lee of the short westerly dike. A deposit will form near the tip and a mud deposit will slowly form throughout the sheltered area.

The sheltered north shore of the landfill, eastward from the bulb, will gradually fill with mud to form mudflats, and marsh plants like those along Hoffman Boulevard will develop along the shore and will gradually propagate further out.

3. Unavoidable Adverse Sedimentation Impacts: Although the buildup of sand beach south of the landfill and mudflat-marsh to the north is unavoidable because of the already existing fill, these phenomena are not deemed adverse, and are not actually results of the proposed project. Construction of the harbor dikes will tend to further interfere with littoral drift, but will not significantly alter what is already destined to occur.

A significant adverse impact will be the buildup of deposits in the area between the breakwater and the harbor entrance which will require ongoing expenditures for dredging and spoils disposal.

Continued sedimentation in the open cell north of the tidal basin will progressively decrease the water depth in that area.

4. Mitigation of Adverse Sedimentation Impacts: The proposed location of the entrance is considered the best for attaining minimum shoaling rates inside of the marina.

To further reduce potential deposition of sediments, the design of the enclosure dikes for the harbor calls for them to be water tight. This will eliminate potential flow through the enclosure and avoid sediment deposit from a larger volume of water than that necessitated by the rise and fall of the water surface inside of the marina.

The rough concrete rubble protection on the dikes and breakwater, as well as the 2:1 slope, will serve to partially dissipate wave energy and reduce reflections from the enclosure walls. This will reduce the amount of sand which would otherwise drop out at the entrance because of wave reduction from refraction. Vertical sheet piling would provide the least dissipation.

The maintenance dredging which will be required for the area just outside the harbor entrance will generate only about 5000 cubic yards

of spoils every 4 to 6 years. This amount could be disposed of quite inexpensively, either on the project site if a suitable area is available or by hauling to sea.

Sand beach areas developing south of the landfill will afford gradually increasing choice recreation use areas. This process could be accelerated by the importation of sand to the site, since the sand can be expected to remain in place.

The developing mudflat-marsh north of the landfill will be aesthetically pleasing, will add to the wildlife habitat, and will greatly benefit the aquatic food chain. In addition, it will enhance wildlife viewing from the project site.

No entrance channel is proposed for the marina. This will somewhat limit marina use but will avoid further problems of shoaling and dredge spoil disposal.

Proper design and operation of the tidal basin flushing system can assure that minimum suspended solids will be admitted to the basin, resulting in relatively clear flushing water being discharged into the harbor.

5. Irreversible Sedimentation Impacts: The buildup of sediments both north and south of the landfill which is already occuring will continue.

Shoaling at the harbor entrance will be an ongoing maintenance factor.

Sediments will drop out in the open cell north of the tidal basin, gradually limiting the draft of the boats using the courtesy dock in that area.

C. WATER QUALITY

1. Existing Water Quality Conditions: The Albany landfill consists of several large relatively flat areas with no particular provisions for drainage of surface water, which either penetrates into the fill or flows off into the Bay. Also, since no special measures have yet been undertaken to seal the perimeter of the fill, tidal action is likely to be causing a fluctuating brackish subsurface water table.

The existing aquatic environment in the area of the project site was covered in the Phase I report and is excerpted below.

> *No data are available that describe the water quality of Cerrito Creek and Codornices Creek, the intermittent streams that form the northern and southern boundaries of the study area respectively. However, the quality of these streams can be expected to be dominated by the quality of the storm drainage from parts of the cities of Albany, Richmond, and Berkeley that is their primary source of water.*
>
> *A recent study conducted for the U.S. Environmental Protection Agency (Sartor and Boyd, 1972) has shown surface runoff to be of poor quality and similar in most respects to untreated domestic sewage. That study notes that for an average American city and except for coliform bacteria "...runoff from the first hour of a moderate-to-heavy storm (brief peaks to at least one-half inch per hour) would contribute considerably more pollutional load than would the same city's sanitary sewage during the same period of time..." This pollutional load is, of course, intermittent and occurs primarily during the first hour of the storm. The above mentioned study and others (Biospherics Incorporated, 1973; Colston, 1974) indicate that street surface runoff contains settleable and suspended solids, biochemical oxygen demand (BOD), nitrogen, phosphorus, heavy metals (particularly zinc and lead), petroleum derivatives, asbestos, and various other debris. These substances derive from various sources including motor vehicles, atmospheric fallout, spills, runoff from adjacent land areas, and deterioration of the pavement iteself.*

Urbanization in the watersheds of Cerrito and Codornices Creeks is of sufficient density and intensity that quantities of pollutants in the runoff have probably reached peak levels. Control programs now in the earliest stages of developemnt by the Regional Water Quality Control Board, San Francisco Bay Basin (SFWQCB) (1974) may eventually effect improvements in the quality of urban runoff.

Various agencies, including the U.S. Environmental Protection Agency (EPA) (1974), the California Department of Health (Hallett, 1974), and SFWQCB (1974) have identified water quality problems along the Albany Waterfront. The EPA survey found shellfish from mudflats within the study area to be highly contaminated with fecal coliform bacteria and to have concentrations of lead in excess of U.S. Food and Drug Administration standards for food. The California Department of Health found concentrations of both total and fecal coliforms in excess of water quality standards, and SFWQCB has documented the occurrence of excessive algae growths in the area. The high coliform counts probably result from wet weather overflows from sewage treatment plants (SFWQCB, 1974); high lead concentrations may result from either industrial discharges or street surface runoff.

The above described data indicate that San Francisco Bay waters in the vicinity of the Albany Waterfront are suitable for some but not all of the beneficial uses established by SFWQCB (1974). The beneficial uses for which water from this part of the bay system would not be suited include water contact recreation and shellfish harvesting. Use of these waters for industrial process supply might be restricted to non-food processing industries.

Water quality in central San Francisco Bay is expected to improve as treatment of municipal wastes is improved in accordance with state and federal standards. The central bay has been classified as an "effluent limited" water segment with the notation that water quality criteria will be met when wastewater treatment in compliance with 1977 federal effluent limitations is achieved (SFWQCB, 1974). SFWQCB notes, however, that the bacteriological quality (indicated by total and fecal coliforms) may not improve unless additional controls are placed on wet weather overflows and storm runoff (SWR, 1975 - pp. 36, 37, 39).

Harding-Lawson Associates, as part of the Phase I study, indicated that they had observed leachate flows at several locations around the perimeter of the landfill (SWR, 1975). The flows were greatest on the westerly portion where surface drainage is poor and earth cover is lacking. It was suggested that tidal infiltration of the fill may contribute to this seepage. They described the observed leachate as ranging from virtually clear and odorless to milky-white with a strong rotten egg odor.

In their Geotechnical Study, Woodward-Clyde Consultants found less evidence of leachate and indicated the following:

> *A resurvey was made of the reported perimeter leaching which was mentioned in the S-W-R Phase I report. During our study, several inspections were made of the perimeter of the landfill at low water and several locations were found where clear water was draining from the more rocky portions of the fill. However, no odor was detected from the seeping waters, and no indications of white or sulfurous leachates as mentioned in the S-W-R report could be found during our inspections. The general impression of the so-called leachate problem was that it is not very extensive and not very noxious. Leachate contamination of Bay waters does not appear to be an item of major concern at this site. Also, the clear seeps are encouraging soil-wise because they indicate that although the permeability of the perimeter rubble fill is not low, no visible soil fines are being piped out to the Bay waters. This suggests that graded soil filter action may exist which would mitigate against possible future seepage to the Bay* (Vol. 1, Appendix 1, pp. 8, 9).

2. Water Quality Impacts: The main impact from the proposed project on water quality will result from the creation of the enclosed marina. As in all such harbors, the concentration of boaters in an area of reduced water circulation will invite problems from nutrient buildup, algal bloom, litter, petroleum spills, and entrapment of flotsam.

The initial dredging which is to occur during the first two construction phases, will cause localized roiling of the water and will place particles and impurities into suspension. Sample number 3 of the existing offshore mud taken by Woodward-Clyde Consultants was from the vicinity of the proposed dredging. The heavy metals analysis of that sample showed 112.4 ppm chromium, 45.0 ppm copper, 52.3 ppm lead, 140.0 ppm zinc, and .26 ppm mercury (Vol. 1, Appendix 1, Table 1). Construction of the new dikes and the filling proposed for slope stabilization will cause similar roiling of the water.

The project design provides for a positive surface drainage system, with surfaces sloped to collectors feeding into subsurface disposal pipes. Storm water drainage will be discharged into the Bay at many points around the site.

Modification of the shape of the landfill, particularly by the addition of the harbor dikes, will affect particle suspension in the vicinity of the site. This is discussed in the previous section.

3. Unavoidable Adverse Water Quality Impacts: The impacts listed above are all adverse and will be unavoidable if the project is implemented.

4. Mitigation of Adverse Water Quality Impacts: To minimize the adverse effects of enclosing the marina with water tight dikes, a tidal basin will be developed to provide slow displacement of the harbor waters. The concept and operational aspects of the tidal basin are explained on pages 23 and 24 of VOLUME 1. In essence, it will impound fresh water at daily high tides to be released into the harbor from three locations late in the lowest daily tide. The 12 acre feet of water discharged into the marina at each cycle will greatly assist in flushing out nutrients and impurities.

Dredging will be by clamshell. Most of the dredge spoils will be placed between the dikes of the harbor enclosure arms. Water draining from the spoils will percolate through the filter membrane, but the membrane will prevent discharge of suspended particles and heavy metals back into the Bay.

To eliminate the penetration of storm water into the landfill, the fill will be capped with a clayey soil and a positive surface drainage system with suitable grading and structures will be developed. No storm water drainage will be discharged into the marina.

The transmission of fluids from the existing landfill into the Bay - whether they be toxic and deleterious or virtually harmless - is expected to be eliminated by the sealing and capping of the landfill as required to close down the operation in an acceptable manner. This is not actually part of the proposed project, but it is assumed that the landfill will be effectively sealed before or concurrent with first phase construction. Sound methods for accomplishing the containment of liquids are described in detail in VOLUME 1.

In the marina, pump out facilities for boat waste will be provided at the service float. Sewage will be pumped directly into the on-shore sanitary waste system connecting to the municipal sewage system.

There will be a positive pumping system at the fuel dock, with excess flow valves in the lines to prevent accidental spillage. A procedure for containing spills has not been developed at this feasibility stage but would be worked out during the detailed engineering.

Although not part of the development proposal, a major factor affecting water quality inside the marina will be avoidance of waste discharges by the boaters. This will necessitate an effective education and control program by the marina staff.

5. Irreversible Water Quality Impacts: Virtually all of the adverse impacts on water quality will be short-term. The overall effect of implementing the project will be a long-term improvement of water quality in the local vicinity.

Storm water drainage from roads and parking lots which will empty into the Bay will be irreversible for the life of the project.

D. ECOLOGIC

1. Existing Ecologic Conditions:

The vegetation found along the Albany Waterfront is very limited and highly disturbed. The original salt water marsh, mud flats (Nichols and Wright, 1971), and adjoining grasslands have been severely altered, and exotic plants have been introduced into the area either intentionally (through landscaping) or accidentally so that little native vegetation remains. Three basic vegetative groups, mud flats, landscaping, and various volunteers, are presently found along the waterfront.

The mud flat vegetation borders the San Francisco Bay west of Hoffman Boulevard and at isolated locations on the north side of the landfill. Cord grass (Spartina foliosa) and two species of pickleweed (Salicornia virginica and S. subterminalis) are the predominant plants found in this group (U.R.S. Research Company, 1973). Cord grass is a 2 to 3.5 foot tall grass-like plant found on the soft mud flats at elevation of 5.4 to 8.4 feet above mean lower low water (Hinde, 1974). It is frequently inundated at high tides and is most abundant near the northern limit of the waterfront, around the mouth of Cerrito Creek. The pickleweeds are found on the mud flats to elevation of 10.35 feet above MLLW with Salicornia subterminalis located above the cord grass but below Salicornia viriginica. Both species are characterized by succulent branches with scale-like leaves and are extremely abundant along Hoffman Boulevard. Other plants found in the upper portions of the mud flats include salt grass (Distichlis spicata), brass buttons (Cotula cornopifolia), gumplant (Grindelia humilis), dodder (Cuscata salina), Jaumea carnosa and Frankenia grandifolia.

Landscaping vegetation is found at various locations along the waterfront. These plants are primarily exotics and are most common around Golden Gate Fields and along Buchanan Street and Hoffman Boulevard.

A number of other plants are associated with disturbed areas such as the landfill and roadsides. Most of these plants are exotics that have become established

accidentally or were deposited as waste material into the landfill. Many household and garden plants have become established in the landfill by the later process. The few areas of the landfill with even a moderate vegetative cover are located primarily on the north end of the peninsula on sites that have not been disturbed for some time and that have received some soil covering. Among the plant species in these and other disturbed areas are mustard (Brassica sp.), filaree (Erodium sp.), pigweed (Amaranthus sp.), wildradish (Raphanus sativus), milkweed (Asclepias sp.), milk thistle (Silybum marianum), dandelion (Taraxacum vulgare), fennel (Anthemis sp.), bermuda grass (Lyndoon dactylon), redbrome (Bromus rubens), wild oats (Avena fatua), and broam (Cytisus sp.).

Marine vegetation along the waterfront is limited to microplankton, primarily large number of diatoms and bluegreen algae in the area of the mud flats. These organisms serve as a food supply for lower organisms, provide an oxygenation and detoxification function, and indicate the high potential productivity of the area. When present in excessive numbers, blue-green algae are also indicators of pollution.

In overall terms, the vegetation of the Albany Waterfront represents a small and highly disturbed portion of that found in the region. Of those groups discussed above, the mud flat represents the most significant vegetative community. While it is limited in size and larger, better preserved mud flats can be found in other parts of the San Francisco Bay, it is one of the few remaining natural communities existing along the east bay waterfront.

The terrestrial wildlife found along the Albany Waterfront are closely correlated with the existing vegetation. Because the vegetation in the area is severely limited and disturbed, the terrestrial wildlife resources are similarly impoverished and altered from their original condition. In some cases the native wildlife has been replaced by non-native species which would not be able to survive in an undisturbed environment. Because of the relationship between wildlife and the vegetation which forms the basis of its habitat, the animals found in the area will be discussed according to the vegetative groups.

The mud flat habitat supports a variety of terrestrial and aquatic animal species. The small size of this habitat in the study area, however, precludes some species or limits them to occasional visitors. Those species that do occur there are strongly associated with the aquatic habitat and the salt marsh north of the study area. Among the terrestrial animals occasionally found in the vicinity of the property are domestic cats and dogs, black-tailed jack rabbit, California ground squirrel, skunk, racoon, red-tailed hawk, short-eared owl, and various song birds. The imported house mouse, California meadow vole, and the endangered salt marsh harvest mouse may reside in the area. The latter species is present in some marsh/mud flat areas of the San Francisco Bay but has not been specifically observed or trapped in the study area (U.R.S. Research Company, 1973; Schaub, 1971, Fisler, 1965), although the habitat is suitable for this species. Raptors such as the bald eagle, marsh hawk, peregrine falcon, and ferruginous hawk have been sighted in the area and may occasionally pass over the property (Golden Gate Audubon Society, 1975; National Audubon Society, 1973).

In addition to purely terrestrial species, a variety of marine and semi-aquatic animals, including a number of shore birds, ducks, gulls, and coots, utilize the mud flats and the overlying waters. A list of most of those birds observed or expected on the tidal flats or in the bay adjacent to the study area is included in Tables 1, 2, 3 and 4. *Among those possibly found in the study area are the endangered California brown pelican (Pelecanus occidentalis), California clapper rail (Rallus longirostris), California least tern (Sterna albifrons), and the rare black rail (Laterallus jamaicensis); the first two of these species have been observed in the area (U.R.S. Research Company, 1973; National Audubon Society, 1973). In view of the number and variety of birds that congregate in the study area, particularly the Hoffman Boulevard mud flats, this area is considered one of the most important waterbird locations in the state (Jurek, 1971; U.R.S. Research Company, 1973) and is used extensively by individuals and various naturalist groups.*

The variety of aquatic oriented birds in the vicinity of the study area, especially north of Golden Gate Fields along Hoffman Avenue, is related to the prevailing calm water conditions, largely a result of

TABLE 1

WATER ORIENTED BIRDS KNOWN FROM THE MUDFLAT AND MARSH AND THEIR MAXIMUM NUMBERS OBSERVED: PRIOR TO SUMMER SURVEY, AND SUMMER SURVEY

	Reported by Calif. Dept. of Fish and Game	URS Survey
Brown Pelican	2	10
Double-Crested Cormorant	-	1
Great Blue Heron	1	1
Common Egret	15	4
Snowy Egret	4	15
Black-Crowned Night Heron	-	2
Mallard	#	14
American Coot	#	6
Semipalmated Plover	3	-
Snowy Plover	5	-
Killdeer	148	32
American Golden Plover	-	7
Common Snipe	1	-
Ruddy Turnstone	8	4
Black Turnstone	21	-
Long-Billed Curlew	7	-
Whimbrel	10	27
Spotted Sandpiper	!1	-
Willet	1172	680
Greater Yellowlegs	2	-
Lesser Yellowlegs	1	22
Knot	33	-
Least Sandpiper	200	52
Dunlin	X1520	-
Short-Billed Dowitcher	X1056	610
Long-Billed Dowitcher	X1	250
Western Sandpiper	!2492	200
Marbled Godwit	105	20
Sanderling	429	-
American Avocet	806	28
Northern Phalarope	1	-
Western Gull	#	350
California Gull	#	20
Ring-Billed Gull	#	6
Forster's Tern	-	121
Caspian Tern	-	4
Black-Bellied Plover	317	33

* Not recorded in surveys, but known from the East Bay.
\# Not recorded in shorebird surveys.
X Difficult to distinguish in shorebird surveys, merged as "peeps": 5854
! Many sandpipers difficult to distinguish, merged in some surveys: 2000.
Maximum shorebird count: 5721 on Dec. 4, 1972, excluding gulls, ducks, and diving birds.

SOURCE: URS Research Company

TABLE 2

WATER ORIENTED BIRDS KNOWN FROM THE EAST BAY SHORE (OAKLAND TO POINT ISABEL) OBSERVED DURING NATIONAL AUDUBON SOCIETY CHRISTMAS BIRD COUNTS (1967-1971) BUT NOT REPORTED IN SHOREBIRD SURVEYS AND THE SUMMER SURVEY

Common Loon	Canvasback
Arctic Loon	Greater Scaup
Red-Throated Loon	Lesser Scaup
Red-Necked Grebe	Common Goldeneye
Horned Grebe	Barrow's Goldeneye
Eared Grebe	Bufflehead
Western Grebe	White-Winged Scoter
Pied-Billed Grebe	Surf Scoter
Brandt's Cormorant	Common Scoter
Pelagic Cormorant	Ruddy Duck
American Bittern	Hooded Merganser
Canadian Goose	Common Merganser
Snow Goose	Red-brested Merganser
Gadwall	Clapper Rail
Pintail	Virginia Rail
Green-Winged Teal	Sora
Cinnamon Teal	Black Rail
American Widgeon	Glaucous-Winged Gull
Shoveler	Herring Gull
Wood Duck	Mew Gull
Redhead	Bonaparte's Gull
Ring-Necked Duck	Heerman's Gull

SOURCE: URS Research Company

TABLE 3

Non-water Oriented Birds (Observed during summer, 1973)

- Red-tailed Hawk
- Rock Dove (European Pigeon)
- Mourning Dove
- Short-Eared Owl
- Barn Swallow
- Cliff Swallow
- Long-Billed Marsh Wren
- Mockingbird
- Starling
- House Sparrow
- Western Meadowlark
- Red-Winged Blackbird
- Brown-Headed Cowbird
- House Finch
- American Goldfinch
- Lesser Goldfinch
- Song Sparrow

Mammals

- Domestic Dog
- Domestic Cat
- California Jack Rabbit
- European Rat
- European House Mouse
- Salt Marsh Harvest Mouse
- California Meadow Vole

SOURCE: URS Research Company

TABLE 4

RARE AND ENDANGERED ANIMAL SPECIES EXPECTED
OR KNOWN TO VISIT THE HOFFMAN MUD FLAT AND SALT MARSH

Rare		
Bird		
	Black Rail[1]	*Laterallus jamaicensis*
Endangered		
Bird		
	California Brown Pelican[2]	*Pelecanus occidentalis*
	California Clapper Rail[1]	*Rallus longirostris*
	California Least Tern[1]	*Sterna albifrons*
Mammal		
	San Francisco Bay Salt Marsh Harvest Mouse[1]	*Reithrodontomys ravirentris*

Many other waterfowl and raptors (hawks, owls, and vultures) are legally protected and regulated by state and federal authorities.

[1] Expected

[2] Known

SOURCE: URS Research Company

the Albany landfill, and the number and diversity of shellfish and invertebrates found in the soft bottom mud. Contributing to the high productivity in the area are the availability of plant nutrients (detritus from the decay of higher terrestrial, salt marsh and mud flat plants) and the abundance of diatoms and algae in the tidal waters and on the mud surface (U.R.S. Research Company, 1973).

In addition to their importance to aquatic birds and invertebrates, the mud flats and waterfront are important feeding and spawning areas for a variety of fishes. The mud flats are particularly valuable to herring (Clupea harengus pallasii) which spawn in the area from December to April. Also found in the area are flatfish (Family Bothidae and Pleuronectidae), croakers (Genyonemus lineatus), skates (Raja sp.), sea bass (Roccus saxitilis), topsmelt (Atherinops affinis), and saltwater perch (Atherinops affinis), all of which support some sport fishing during the year (U.R.S. Research Company, 1973).

Landscape vegetation is found primarily around Golden Gate Fields and at other isolated locations in the study area. The primary wildlife species which frequent this habitat are the domestic pigeon (Columba livia), mourning dove (Zenaidura macroura), mocking bird (Minus polyglottos), robin (Turdus migratorius), Brewer's blackbird (Euphagus cyanocephalus), smaller song birds and the introduced starling (Sturnus vulgaris) and house sparrow (Passer domesticus).

Because of a lack of vegetative cover and food, the landfill is relatively impoverished in terms of wildlife numbers and species. Norway rats (Rattus norvegicus), house mice (Mus musculus), California ground squirrel (Otospermophilus beecheyi), and sea gulls (Larus sp.) are the most common animals on the landfill. Some shore birds and ducks may also be observed within or along the lagoons or perimeter of the landfill, while western meadow larks (Sturnella neglecta) can be found on the few vegetated areas of the landfill during the spring and summer months. Racoons (Procyon lotor) and skunks (Mephitis mephitis) may also occasionally be found on the landfill (SWR 1975 - pp. 41-45.).

As part of the Planning and Feasibility Study, the consulting firm of Harvey, Hartesveldt, Heath & Stanley, Inc., Ecological Consultants, examined the site, made planning recommendations, and evaluated the impacts of the proposed development during the preparation of the master plan. The following sections derive from their report (Appendix 1).

In the investigations, the Ecological Consultants found these fish in the waters around the project site:

Sport Fish	Other Fish
Jack smelt	Staghorn sculpin
Striped bass	Pacific herring
Pile perch	Northern anchovy
Starry flounder	Brown rockfish
Leopard shark	Surf smelt
Dogfish shark	Long-finned smelt
Bat ray	

2. Ecologic Impacts: The existing landfill has very limited vegetation and offers minimal wildlife value. Although the sparse assortment of existing plants will be obliterated, the introduction of a soil cap capable of better supporting plant life, and the managed development of a fully landscaped environment will provide for richer terrestrial wildlife habitat.

The marina development will alter the sand-mud bottom in that area, with the initial construction dredging temporarily destroying the benthic invertebrates. Subsequently, the quieter waters inside the harbor will produce a fauna similar to that in the present enclosed cell (lagoon). Sponges and oysters are likely to become established and add to the diversity of invertebrate species in the marina.

The silt bottom in the area of the launching ramp supports a modest benthic invertebrate fauna not unlike vast areas in the Bay. The proposed limited dredging in that area will not cause a significant loss.

Within the existing enclosed cell there is relatively calm water with little tidal fluctuation. Converting this to a tidal basin will accelerate the water exchange rate and will reduce water temperature in the enclosed space. The existing large branching colonies of sponges (Haliclona sp.) will be reduced and the same trend is likely to occur with the oysters (Ostrea lurida) which are presently there.

The benthos which will be covered by the proposed fill around the edge of the site is quite meager and the impact will be quite minimal.

3. Unavoidable Adverse Ecologic Impacts: All loss of benthic flora and fauna resulting from fill and dredging will be adverse, but not significantly so. Additional fill will permanently reduce the area of Bay bottom, but the affected benthos is sparce and common to the Bay. The enclosed harbor will generate a higher concentration of invertebrates after the initial disturbance caused by construction and dredging.

4. Mitigation of Adverse Ecologic Impacts: In general, the modifications to the site will be beneficial and will overshadow the adverse impacts. The benefits for the aquatic environment essentially derive from the increase in length of the shoreline and the diversification of microhabitats.

The concrete rubble along the shoreline will afford habitat for rocky shore invertebrates and should support bay mussels, barnacles, rock crabs and intertidal algae such as are already present. Increasing the length of shoreline by the addition of dikes and breakwater will substantially increase this habitat. The proposed flatter slopes

will also add surface area at the intertidal zone. Colonization by invertebrates and algae in the new rubble riprap should occur within a few months and the increase in these organisms will in turn support a greater fish and bird population than is currently found at the site.

The developing sand beaches along the south edge of the landfill and the developing mudflat-marsh along the north, which were discussed in a previous section, will increasingly benefit the biologic environment. Extending the marina enclosure and breakwater further into the Bay will add to this phenomenon. Substantially enlarged areas of marsh will enhance the productivity of the Albany Waterfront, which is minimal at present.

Construction of the marina will have other beneficial effects as well. The enclosed water will be calmer and warmer and will support a more diverse and more abundant flora and fauna than what presently exists in the same location. There will be special benefit for wintering waterfowl because of the increased protection the marina enclosures will afford against northwest winter storm winds. This will be particularly beneficial to ducks in protecting them from wind-whipped waves and preventing loss of their body heat. The protected lee may shelter 2,000 to 3,000 ducks at a time.

Creation of the tidal basin will most likely change the existing enclosed cell into a fishing area of greater value than at present, although it may be limited by higher water temperatures than the open Bay. The basin with its controlled tidal effect could afford an opportunity for fishery management or specialized research. Improved water quality in the marina resulting from the tidal basin flushing action will obviously benefit the benthic organisms within the marina.

The fishing pier appears to be located at a near optimum site where tidal, wave and current action will be maximal. Growth of algae and invertebrates around the piles will attract the typical pile-associated fish.

The fishing potential at the pier and along all of the outer perimeter of the project can be improved by the sinking of auto tire artificial reefs about 100 yards away. These would increase diversity of food organisms and would thus attract large sport fish to the areas readily accessible to fishermen. Two sources of information on how to create such artificial reefs are listed in the References.

It has been suggested by a representative of the California Department of Fish and Game that areas of gravel on firm sub-strata would be beneficial for increasing the local population of clams and bait shellfish.

At the present time, piping of water into the landfill and erosion of its surface are depositing fine materials around the edge of the site inducing anaerobic conditions. The measures proposed for sealing the fill and eliminating surface erosion will substantially benefit benthic organisms at the perimeter.

Developing a fully landscaped park and introducing landscaping into the marina and commercial areas will create wildlife habitat such as does not presently exist at the site. The opportunity will present itself to select plant materials which will be most beneficial for the fauna attracted to the site.

Special attention should be given to the area north of the landfill and west of Hoffman Boulevard. This large expanse of mudflat is particularly valuable for waterfowl and shorebirds. In the future, every effort should be made to preserve this crescent as a wildlife area of great significance.

5. Irreversible Ecologic Impacts: The introduction of buildings and paved areas will adversely affect the very meager natural values of the existing site. Similarly, additional fill around the existing landfill and fill for the marina elements will destroy existing benthos. Neither of these impacts are considered significant.

E. ARCHAEOLOGIC AND HISTORIC

1. Existing Archaeologic and Historic Conditions:

The Costanoan Indians inhabited areas in and about the Albany area (Rolle, 1963). The potential for remains of their habitation on the site is minimal given the site composition of fill material and bay mud.

European exploration of the area was predominantly by the Spanish. Settlement followed exploration, but it was not until 1908 that Albany incorporated as a city. Much of its population at that time was comprised of the refugees from the 1906 earthquake in San Francisco (Ruth and Krushkhov, 1966).

There are no noted historic sites on the project area according to data in The California History Plan and the booklet California Historical Landmarks. (SWR, 1975 - pp. 63, 64.)

2. Archaeologic and Historic Impacts: None apparent.

3. Unavoidable Adverse Archaeologic and Historic Impacts: None apparent.

4. Mitigation of Adverse Archaeologic and Historic Impacts: None required.

5. Irreversible Archaeologic and Historic Impacts: None apparent.

F. AESTHETIC

1. Existing Aesthetic Conditions:

The visual context of the project site is defined primarily by the adjacent urbanized area of the East Bay, shoreline along the San Francisco Bay, and the backdrop of rolling hills and ridges. The man-made aspects of the site, i.e., the landfill operation, have created an extension of the shoreline into the bay in the form of a small peninsula. The site is generally visible fron near and moderate distances to the north, east, and south. Primary viewscapes of the site are from the freeways, Golden Gate Fields, and from Albany Hill. Distant views to the site are from the Richmond area to the north and northwest; portions of Marin County and Angel Island to the west; and from the Golden Gate, San Francisco, and Bay Bridge to the west and southwest. On clear days, views of the site are also possible from the ridge lines to the east.

The vegetative cover (in the area) *is limited to the salt marsh areas adjacent to the creeks near the northern and southern ends of the* (City's shoreline) *and areas adjacent to Golden Gate Fields, and the freeways which are landscaped. Other than these areas, the landfill is a barren place which.... is a low quality view. This is especially true to motorists along the west side of Albany Hill who, upon arriving at openings in residential rows, expect to see a scenic view of the Bay and find instead the landfill near center of their view.*

Views from the site are basically the reverse of those discussed above. Nearby significant views are of Albany Hill to the east and the landscaping and structural features of Golden Gate Fields to the south. Northeast and southeast views cover the urbanized areas of the East Bay, and northerly views include the refineries, industrial plants, and assorted structures of Richmond. More scenic views from the site are those which cover the San Francisco Bay and such features as the Golden Gate Bridge and the City of San Francisco. (SWR, 1975 - pp. 62, 63.)

2. Aesthetic Impacts: The most obvious visual impact which will result from implementation of the project will be the conversion of the landfill from an unsightly, virtually barren mass to a fully

landscaped attractive feature. Side slopes will be made more gentle and the large expanses of exposed rubble (Photos 3, 4 and 6, Plate 5) will be eliminated. The top of the project site will be contoured to add variety and visual interest, especially as seen from ground level. Trees when they reach maturity, will accent this change in height.

Addition of the marina enclosure dikes and breakwater will further intrude man-made elements into the Bay waters. This will interfere with the view of the Bay from other locations, but will also provide dramatic vista points and additional perimeter from which the Bay and the views can be experienced.

Roads, parking lots, paving, marina berths, and the various buildings around the site will all be structural elements adding a sense of urbanization to the presently undeveloped site.

3. Unavoidable Adverse Aesthetic Impacts: Additional filling of the Bay, with its intrusion into the appearance of the open waters, will be a significantly adverse aesthetic impact.

Concentration of parking in large paved areas will introduce aesthetically unpleasant elements on the site.

4. Mitigation of Adverse Aesthetic Impacts: There are a number of measures proposed in the master plan which will minimize or overcome the adverse aesthetic effects of the present landfill and of the proposed imporvements.

Significant visual benefits will derive from the work which has to be done to bring the landfill to a condition satisfactory to the regulatory agencies. Slopes will be eased and exposed rubble or debris-strewn surfaces will be covered with earth. Capping material should provide soil capable of supporting plant life.

The INITIAL development portion of the landfill will be shaped for variety, and the appearance of the existing flat-topped plateaus will be enhanced. Mounds, with the assistance of screen planting, will help to visually separate the parking lots from the use areas. Wherever possible, roads are to be located in swales to minimize the impact of automobile traffic. Berms and planting, as well as distance where possible, will all be utilized to conceal parking areas from view from the Bay.

The landscaping shown on Plate 4 is quite conceptual, but does demonstrate the overall treatment proposed for the project. For most of the park area, planting will be quite informal and will consist essentially of rough grasses, ground covers and high-branching trees. Bushes, shrubs and other plant materials which would obstruct views or create security problems will be avoided. Species of trees of differing height will be utilized, with tall trees on the mounds to accentuate the changes in land form. Rough grasses will be used instead of trimmed lawn to set a tone of natural informality quite different from the typical urban parks. Spaces defined by tree groupings and openings judiciously placed for framing views are reflected in the plan.

In the commercial area and around the marina, landscaping will be somewhat more sophisticated. In those areas, selections will be made to enhance the more defined development, and will include lusher and more colorful plant materials.

Vista points, hills, shoreline paths, a lookout shelter, and the fishing pier will all afford opportunities for experiencing the very dramatic views from the site. The three restaurants will be located where they will have unobstructed views over the marina in a southwesterly arc.

An early planning decision eliminated a proposed boat repair facility from the site primarily because of the adverse visual impact it would have.

Concrete rubble which is proposed for bank protection around most of the shoreline of the site will be selected for size and appearance, with pieces between 12 inches and 4 feet. Reinforcing rods, pipes and other protruding metal pieces will be removed. Wave runup and the elements will gradually soften the appearance of these protective slopes.

Rerouting the access road to the north of the Golden Gate Fields parking lots will remove it from a very unattractice area and locate it where the drive to and from the site will be a pleasant experience. The new road alignment will offer changing views of the Bay and distant features, and it could easily be screened from the parking lots by attractive landscaping.

The Conclusions in VOLUME 1 include a recommendation that overall design control be maintained to assure quality of aesthetic results for both the public and the private improvements. This control could embrace graphics, colors, scale, landscaping, architectural design, and all other aspects of visual impact.

5. Irreversible Aesthetic Impacts: Except for the visual impact from additional filling of the Bay (which is not likely to be reversed), none of the aesthetic impacts will be irreversible.

G. NOISE

1. Existing Noise Conditions:

Noise audible along the Albany Waterfront varies with the location, time of day, and type of surrounding barriers. The predominant noise source affecting the study area is vehicular traffic on Routes 17 and 80. Noise contours associated with these highways indicate that this source impacts all of the area except for the landfill site. Even on the landfill, highway noise is evident except for a few locations on the western edge where neither Routes 17 or 80 are visible. At these few locations the noise environment can even be considered quiet in contrast with the rest of the waterfront.

Traffic associated with the Golden Gate Fields is a major noise factor along the waterfront during the racing season. Buses and automobiles generate noise levels of up to 58 dBA during peak arrival and departure hours.

The Southern Pacific Railroad lines also represent a major noise source along the waterfront. Approximately 26 to 29 trains pass through Albany a day with about 70 percent of these operating between 7 p.m. and 7 a.m. (Duncan and Jones, 1974). Noise levels from those operations are between 90 and 95 dBA at 500 feet and 70 to 75 dBA at 1,000 feet (Duncan and Jones, 1974).

On the landfill, disposal trucks and tractors are significant contributors to the noise levels. Individual trucks generate noise between 82 and 93 dBA while the tractors typically produce noise between 80 and 95 dBA (Bolt, Baranek, and Newman, 1971). The variations in these levels are due to the size of the vehicle, the load, and the effectiveness of muffling equipment.

Other noise sources audible from the waterfront are boats and ships on the bay, fog horns, and bird life. (SWR, 1975 - pp. 60, 62.)

2. Noise Impacts: Implementation of the project will result in equipment generated noise at the site during the four construction phases. Noise sources and levels will be similar to those noted above for the landfill operation.

Automobiles moving through the site once it is in use are expected to generate noise levels similar to what is experienced 100 feet from light traffic - or about 50 dB(A).

Noise from power boats is expected to be minimal because of the speed limit within a harbor.

3. Unavoidable Adverse Noise Impacts: Virtually all impacts of noise, are adverse, and particularly so in a setting where visitors come for a relaxing recreational experience.

Noise from vehicular traffic on Routes 17 and 80 is so attenuated by distance that its effect, while adverse, is insignificant on the project site at the west end of the landfill.

Vehicles moving through the site will adversely affect the areas near the roads.

Noise from construction sources will be significantly adverse on the site, although they generally will not occur on peak use weekends and holidays.

4. Mitigation of Adverse Noise Impacts: To minimize the impact from on-site vehicular noise on the park visitor, the northeasterly portion of the site will contain no roads or parking, leaving a relatively quiet area for passive outdoor use.

Since the main impact of noise is by line-of-sight transmission, from its source, opaque dense barriers between the source and the listener are quite effective. The differences in elevation of the finished site and the judicious location of mounds will help to screen many portions of the site by providing such sound barriers.

5. Irreversible Noise Impacts: None.

H. CIRCULATION

1. Existing Circulation Conditions:

Regional access to the project site is from Route 17 and Interstate 80 via Buchanan Street. People coming to the site from the City of Albany have direct access via Buchanan Street. The circulation system is not greatly affected by the activities which take place on or adjacent to the project site, except for Golden Gate Fields during the horse racing season (February through the first week in June).

Both freeways are congested and at or near capacity during peak commute hours. Also, due to on and off ramp locations and persons going from Interstate 80 to Route 17, there is a significant amount of weaving and lane changing on Interstate 80 going north between Gilman Avenue and Buchanan Street.

There are presently no data indicating traffic volumes on Buchanan Street west of the freeway. East of the freeway it serves as the main Albany exit from the freeway system and provides direct access to commercial and residential areas of the city.

From the second week in June through the last week in January, the only traffic generators on Buchanan west of the freeway system are the landfill operation, the golf course at Golden Gate Fields, and the tennis courts adjacent to Golden Gate Fields. Tennis and golf use is low during weekdays with moderate use occurring on weekends and during the summer months; for tennis in particular, use of the facilities, and hence traffic generation, is low due to the lack of publicity regarding the courts and prevailing winds that adversely affect playing conditions. The landfill operation generates constant traffic, predominantly trucks; however, a side road is used for access to the landfill and the only conflicts generated between this and other traffic occurs at the freeway underpass when trucks leaving the landfill turn south on Interstate 80 and vehicles cross this path when coming to the Golden Gate Fields area along Buchanan Street.

The major traffic generator in the area is Golden Gate Fields. When in operation, peak hour arrivals as well as peak hour departures can add as many as 2,125 to 4,860 vehicles to the traffic volume on Interstate 80 within a period of an hour to an hour and one-half. Given directional flows of freeway traffic and that coming to or leaving from Golden Gate Fields via Buchanan Street and Gilman Street concomitantly with the time periods of peak volume traffic flows, the traffic generation of Golden Gate Fields, while causing some congestion to freeway traffic, does not substantially contribute to present directional flow and volume of peak hour commute traffic. The primary exception to this is the traffic generated by the non-paying persons who attend the seventh, eight, and ninth races. These people arrive around 4:30 p.m., predominantly from communities south of the project site, and add to early evening commute traffic on Interstate 80.

At the present time no regular transit lines run on Buchanan Street west of the freeway. Access to Golden Gate Fields via AC Transit is along Gilman Street. Some buses do enter the Golden Gate Fields area by Buchanan, primarily Greyhound buses which carry non-local visitors to Golden Gate Fields. On weekdays they will average three to four vehicles with maximums of ten vehicles on weekends and holidays (SWR, 1975 - pp. 58,59).

Pedestrian and bicycle access to the site by way of Buchanan Street is hazardous and unpleasant. A route is provided for pedestrians, but bicyclists have to compete with fast-moving traffic, through a maze of intersections, without any assigned bicycle lane. Pedestrians have to climb the equivalent of three flights of stairs at the south end of Cleveland Avenue to reach an overpass across the Southern Pacific Railroad tracks. From there they have to pass under the freeways, with no signals or stop signs at the several roadways which must be traversed.

2. Circulation Impacts: The proposed development will generate a substantial amount of vehicular traffic - perhaps as much as 400 to 450 cars during a two hour peak on busy days. The INITIAL access road

following the Buchanan Street right-of-way extension would carry this traffic between major parking lots of Golden Gate Fields, and would cause substantial conflict with heavy foot traffic and with cars using the parking lots during the racing season. Pedestrians and bicyclists would also be in conflict with the racetrack visitors if they are obliged to follow Buchanan Street extension to the project site. Moreover, Golden Gate Fields will obviously have a nasty control problem if visitors to the waterfront facilities freely move through the racetrack parking lots on the public right-of-way.

One of the most serious drawbacks to the successful operation of the waterfront development, until access is isolated from the racetrack parking lots, is the fact that racing patrons will use the waterfront parking areas when racetrack spaces are full. This will happen on days when the demand for parking is simultaneously heaviest at both the racetrack and the waterfront.

3. Unavoidable Adverse Circulation Impacts: Visitors to the waterfront facilities will add to the traffic load on Buchanan Street and on both freeways. However, this adverse impact is not considered significant. Peak loads during the normal visitor day will be quite small, and peak loads on week ends and holidays, although substantial, will be accommodated because of the absence of commute traffic.

The circulation conflicts which will exist until Buchanan Street extension is rerouted around the Golden Gate Fields parking lots and until it is fenced off as proposed in the ULTIMATE development will be significantly adverse to both the racetrack and the waterfront.

4. Mitigation of Adverse Circulation Impacts: The principal mitigation measure will be the realignment of the access road and trail as shown on the master plan for the ULTIMATE development area, and the erection of a continuous effective fence to prevent pedestrian flow between the racetrack and the waterfront.

At such time as public transportation is provided to the site, a substantial reduction in automobile traffic will be possible.

Traffic signals at strategic locations in the maze of intersections under the freeways would reduce the hazards for pedestrians and bicyclists visiting the site, and would probably benefit vehicular movement as well.

Alternative uses at the site - such as residential, intensive commercial, or industrial - could generate far greater peak traffic loads during peak commute hours. Locking the site in to the proposed recreational use will prevent that from occurring.

5. Irreversible Circulation Impacts: Increased traffic to and from the project will continue as long as the development exists.

I. PUBLIC SERVICES AND UTILITIES

1. Existing Public Services and Utilities: Service lines for all utilities are located in the same general area - near Buchanan Street, between the Southern Pacific Railroad and Highway 80.

Pacific Gas and Electricity (PG&E) will distribute gas and electricity to the site from that location. The East Bay Municipal Utility District (EBMUD) is responsible for providing water and sewer service. Solid waste disposal for the City is performed by Oakland Scavenger Company, although that service is by a year-to-year contract.

> *Police: The Albany Police Department is located approximately one-half mile from the project site, with station-to-site response time being approximately two minutes (Chief Simmons, 1975). No particular problems are generated in this area, and it is included within the regular patrol spectrum.*
>
> *Fire. The Albany Fire Department is located on Buchanan Street, east of Interstate 80, approximately one-half mile from the waterfront area. Response time is about 1-1/2 to 2 minutes (Assistant Fire Chief Miranda, 1975).*
>
> *At the present time the Albany Fire Department has a staff of 24 people. Basic equipment includes: 1,250 gallon pumper, 1,000 gallon pumper, ladder truck with 1,500 gallon capacity, a snorkle, and two 500 gallon pumpers. Existing use of the site, the landfill operation, has not generated any fire problems (Easley and Brassy Corporation, 1973).*
>
> *In addition to the above fire protection services, "...Albany has cooperative agreements with the cities of Berkeley, El Cerrito, and Richmond, for dealing with large fires or fires at or near the City boundaries..." (Duncan and Jones, 1974). Access to the site from the Berkeley area could also be via Gilman Street* (SWR, 1975 - p. 57).

2. Public Services and Utilities Impacts: The nearest existing utilities are in the vicinity of the Buchanan Street - Highway 80 interchange. Service and sewer will have to be extended from that location along the Buchanan Street right-of-way to the center of the INITIAL project site, a distance of approximately a mile (Plate 11). Since there will be no connections by other users, the cost for these utilities will be entirely chargeable to the project.

All utilities throughout the project will have to be designed and placed to accommodate anticipated differential settlement without major disruption of service. Transporting sewage from the restrooms located at lower elevations will require the use of lift stations and pressure mains.

It appears that there will be no special problems in obtaining electric, gas and water service to meet the requirements of the proposed development.

Although there is excess wastewater capacity in the existing EBMUD sewage system, EBMUD has indicated that stormwater improperly enters the City of Albany's sanitary sewer collection system, causing EBMUD's lines to overflow during major storms (Foster, 1976). It is understood that the City has plans for reducing stormwater inflow and infiltration into the sanitary system and that it will be possible to accommodate the proposed development by the time connection is required.

Since the majority of visitors to the development will be local residents, the solid waste generated at the project will not significantly add to the East Bay solid waste stream. The solid waste from the site will be disposed of by the independent operator under franchise to the City at the time for removal of municipal waste.

Both police and fire facilities are located conveniently nearby - actually with very short response time for reaching the site. Although the type

of improvements proposed may not require any additions to the equipment or manpower of the Fire Department, the Police Department may be obliged to provide auxiliary patrol services during occasional peak hours at the waterfront.

3. Unavoidable Adverse Public Services and Utilities Impacts: It appears that the only significant adverse impact will be from the consumption of energy required for the construction and operation of the waterfront project.

4. Mitigation of Adverse Public Services and Utilities Impacts: Mitigation measures will best be developed during the detailed design of the project. At that time, investigation and experience can assist in the selection of the most energy-efficient equipment, and broad decisions on how to conserve energy can also be made.

An example of the design process possibilities can be demonstrated with security lighting. Not only will different types of fixtures and layout require different amounts of energy to achieve similar results, but the questions of how extensive security lighting needs to be and at what hours it should operate are also subject to evaluation.

The concept of the tidal basin and its method of operation will conserve energy. Instead of depending upon pumps to circulate water through the marina, daily tidal action will furnish the energy required for moving large quantities of water. A very small amount of energy will be consumed merely to operate the controls.

5. Irreversible Public Services and Utilities Impacts: None.

J. SOCIO-ECONOMICS

1. Existing Socio-Economic Conditions:

"Approximately 678,000 East Bay residents live within 18 minutes driving time of the...waterfront area" (Leon Rimov and Associates, 1969). These people are primarily the populations of the cities of Richmond, San Pablo, El Cerrito, Albany, Berkeley, Emeryville, Piedmont, Alameda, and Oakland. Growth in these cities as a whole, based on Association of Bay Area Governments Losouth population projections, will generate a population of approximately 714,000 by 1980 and 748,000 by 1990. The Losouth projection, in terms of population trends, reflects "the slower overall regional growth rate which has occurred since 1970 with the highest share of growth continuing in the souther counties" (Association of Bay Area Governments, 1973).

The City of Albany comprises only two percent of the above regional population and, in fact, since 1970 the City has experienced a steady decline in population from 17,590 in 1950 to 15,561 in 1973 (U.S. Department of Commerce, 1973). Part of this decline is undoubtedly due to suburbanization in the East Bay area, a trend reflected in decreases in population per household. "Census information indicates that in the past several decades the predominant population makeup has changed from young families with children, to older couples who have remained in the community after their children have left home" (Duncan and Jones, 1974). Presently, 23 percent of the population is over 60 years of age (Duncan and Jones, 1974). The present population, however, need not be considered a static one; the married student housing for the University of California at University Village and trends of young singles and couples purchasing residences formerly occupied by older people indicate a possible turnover in population composition. In addition, this change may be fostered to some extent by the future tenants of the Gateview Apartment complex being built at the base of Albany Hill. The main population growth to 1995 in the City will be from this development with its potential population of 5,700 residents (Duncan and Jones, 1974).

Census data for the City of Albany note a total civilian labor force of 6,691 and an unemployment rate of five

percent in 1970. Undoubtedly, given the above noted demographic changes in the City of Albany, this labor force has decreased from the 1970 total; also, with the present economic state of the nation, the unemployment is probably higher. Most of the employed residents work in one of the following industries: Manufacturing, Retail Trade, or Educational Services. Census data also reveal that within these areas the primary occupations are professional, technical and kindred workers, clerical and kindred workers, and craftsmen, foremen and kindred workers. Despite the fact that 16 percent of the people are employed in Educational Services industry, only 3 percent are involved in actual teaching.

The Preliminary General Plan notes that "...in comparison to surrounding communities, most of the housing stock in Albany is reasonably priced..."; however, "...given the pattern of development in Albany and the lack of opportunity for new development, it is difficult for Albany to provide a full range of housing types for all socioeconomic groups..." (Duncan and Jones, 1974). The bulk of recent housing construction has been apartment units with concomitant "...rapid changes in the tenure of the housing stock from owner to renter, especially in the older units..." (Duncan and Jones, 1974). Hence, future housing options for moderate and low income people may be predominantly renting rather than ownership. As mentioned above, the major new housing area open to future residents is the Gateview Apartment complex at the foot of Albany Hill. (SWR, 1975 - pp. 51, 54, 55.)

2. Socio-Economic Impacts: Williams-Kuebelbeck & Associates, Inc., Economic and Financial Consultants thoroughly covered the economics and financial feasibility of the project in the Financial Analysis Section of VOLUME 1. That part of the report covers such fundamentals as: development potential, funding, operating income, benefit-cost analysis, and implementation of the project. To fully appreciate the economic aspects of the project, reference is necessary to that report.

The project will have impacts upon the community in addition to those specifically covered in the Financial Analysis. Employment will be provided for construction workers over the four year period required to

complete the development. Starting after the first phase of construction is completed, and increasing as additional improvements are installed, there will be a need for a variety of operation and maintenance personnel. Jobs will be available in park maintenance, food handling, retail sales, marina operation, and related activities. The project will also indirectly encourage employment and assit the economy through its ongoing need for goods and services from the community.

Perhaps the most significant local and regional impact of the waterfront project will be from the direct benefits to the public. Marine-oriented recreational opportunities - not readily available around San Francisco Bay - will be afforded to meet a wide spectrum of individual interests and economic status. A majority of the visitors to the site will partake of recreational pleasures at no cost, although facilities will also be available for shopping, snacking or dining. Boating will not be limited to those who can afford the rental of a slip, but the launching ramp and courtesy docks will also be there for anyone who wants to use them without charge.

Access to the Bay around the entire perimeter of the new landform has been maximized in the master plan.

3. Unavoidable Adverse Socio-Economic Impacts: None.

4. Mitigation of Adverse Socio-Economic Impacts: Not applicable.

5. Irreversible Socio-Economic Impacts: None.

GROWTH – INDUCING IMPACTS OF THE PROPOSED ACTION

5. GROWTH INDUCING IMPACTS OF THE PROPOSED ACTION

The proposed development at the Albany Waterfront will both contribute to and restrict growth in the area.

The project will provide employment to construction workers over a period of four years and to operation and maintenance personnel for the life of the facility. The commercial complex will contribute through the purchase of goods and services and through the generation of tax revenues. The marina and launching ramp will encourage boating, and through that will also add to the purchase of goods and services. These benefits will all contribute to the economic growth of the area.

A significant element in the population growth of the Bay Area is the availability of recreational opportunities for its residents. This project will provide additional recreation and park facilities, with access to the Bay for all users. Such amenities will add to the overall attractiveness of the area as a place to live and will be growth-inducing.

On the other hand, if the project is implemented with legislative restrictions on the type of development which can take place on the site, it will prevent the use of the landfill for residential, intensive commercial, or industrial purposes. Without such a commitment of the land to a low-intensity development, there is no way to anticipate how the site may be developed in the future. Therefore, the project - with suitable limitations assuring development according to the master plan - will inhibit rather than induce growth. This will prevent potential physical and economic growth in the immediate area, and will also have similar regional impacts.

THE RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF MAN'S ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

6. THE RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF MAN'S ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

In the short term, there will be disruption to the environment during construction accompanied by temporary loss of benthic flora and fauna. However, the proposed modifications to the site will also have a long-term effect upon the immediate vicinity. On balance, it appears that the ecologic impacts will be beneficial and that fish and wildlife populations will increase through improved food supply and habitat. The long-term effect will be to enhance productivity of flora and fauna both in the Bay and on the land.

The use of the site as a landfill has been a short-term use. Importing additional select earth and rubble to complete the enclosure of the fill and to build the marina dikes and breakwater will, in effect, be a continuation of this short-term use. But, this activity will contribute to converting the site to a condition suitable for long-term productive use by man.

ALTERNATIVES TO THE PROPOSED ACTION

7. ALTERNATIVES TO THE PROPOSED ACTION

A. NO PROJECT

This alternative would leave the landfill undeveloped in approximately its present configuration. The only changes would be those resulting from the work necessary to close down the landfill operation in compliance with health and safety regulations. This would require about 2.5 acres of fill in open water and about 1.0 acre within the enclosed cell. Capping the fill and shaping it for drainage would also somewhat modify the land form, but not significantly.

The original 1919 grant by the State of California to the City of Albany was intended for the development of a harbor on the submerged tidelands to promote commerce and navigation. Actions by the City in authorizing the landfill operation and having master development plans prepared were aimed at creating a harbor and related commercial facilities, with the fishing and public access provisions required by the grant. However, without substantial modification, the present landfill cannot meet those grant conditions.

Should the site remain undeveloped, there would be many obstacles to opening the area to public use. The lack of potable water and sanitary facilities would probably meet with strong objections to such use from the Department of Health. Because of the obligations the City would assume if the site was opened for public access, there would be substantial ongoing costs for policing the area. Moreover, once the public is admitted - even to attractive undeveloped park areas - maintenance personnel must be provided, even if only to clean up litter and remove hazards. Without any development, the site would not generate the revenues required for security and maintenance, and these would have to be supported out of the

general fund. It has been the experience of park administrators that admitting the public to unimproved areas generally results in pressure for improvements regardless of the intended low-keyed use, and keeping the public out is usually impossible.

Leaving the site in its undeveloped state would mean that the many benefits to the public and the City incorporated into the proposed project would not come into being. The master plan provides for a wide variety of uses which would serve a broad spectrum of the public on into the distant future. Also, the financial analysis of the project indicates that substantial surplus revenues beyond those required for operating expenses and debt service will be generated by the tax increment bonds, if the project is developed as proposed (Vol. 1 - p. 83). Both the recreational use opportunities and the City revenues would be lost if there is no project.

Perhaps one of the most serious objections to leaving the site unimproved, is the possibility, and even the likelihood, that it would be developed for use at some future date. Implementation of the master plan at this time would make it possible to fix the type of development which will take place and block other less desirable categories of use from happening. As suggested in VOLUME 1, the amendment to the 1919 grant which would be required from the legislature to permit the proposed project to proceed could be the vehicle for prohibiting uses not in accordance with the master plan.

B. REMOVAL OF EXISTING LANDFILL

A possibility which has been raised would be to remove the landfill entirely and return that portion of the Bay to its original state. This alternative would involve such difficulties as to be virtually impossible to accomplish.

The operation required to remove the fill material would be a tremendous undertaking involving a great deal of time, energy and expense. All of the potential disposal areas within reasonable distance have either ceased operation or will do so in a very short time because of lack of further capacity. This means that all of the material would have to be hauled a great distance to some remote inland site - if indeed an acceptable disposal area could be found. The adverse environmental impacts which would have to be faced at such a site would be significant, to say nothing about the impacts of truck traffic and energy consumption.

Excavation of the material would be extremely difficult because of the wide variety of sizes, shapes and weights. In addition, much of the excavation would be under water.

The removal process would open up the landfill and release leachate and other toxic or deleterious materials into the Bay. This - coupled with the roiling of the waters, suspension of particles, and general disturbance of the area - would have a severely detrimental effect upon the quality of Bay water for the many years it would take to complete the removal.

C. ENLARGED LAND AREA

Another possibility, which is just the opposite of Item B, would be to continue the landfill operation and increase the size of the site to a substantially larger area than is proposed in the master plan.

At the present time, there is no permit to proceed with further filling of the Bay at the Albany site. To get permission for filling will require approval from a number of regulatory agencies which have responsibility for protection of the Bay. There has been

repeated indication from the staffs of those agencies that all additional fill will have to be justified as either necessary for health and safety or essential to the implementation of the project. The master plan has been moulded to meet that constraint and it is highly unlikely that a larger land mass would gain the necessary approvals.

A larger landfill would obliterate more of the benthic flora and fauna without necessarily adding length of perimeter or other ecological benefits included in the proposed land configuration. It would also require extending the life of the landfill operation with an equivalent delay in development of the site. A larger site would also demand greater expenditures for development and maintenance without generating additional revenues, and this would prevent the implementation of the project.

The principal benefit to be derived from enlarging the site would be to increase the park area. The main attraction for visitors to the development - as well as the main benefit to them - will be the varied opportunities for contact with the Bay. The plan takes advantage of the unique setting and provides many such opportunities around the site. Adding conventional park spaces at this location cannot be justified from the point of view of use or benefit.

D. NO MARINA

This alternative would eliminate 7.3 acres of fill proposed to be placed in the Bay for construction of the marina enclosure dikes and breakwater. This would reduce the adverse impacts upon the existing benthos but would also eliminate the ecological benefits derived from the marina as described in Section 4D.

A preliminary analysis of the financial feasibility of three alternatives was submitted to the City in March 1976. The first alternative

was for development essentially as shown on the master plan. The second included the same improvements, but omitted the marina. The third was similar, but also eliminated the commercial development, leaving the site to be developed solely for park use. The fundamental difference between the first and the other two is that without the marina the project would not be eligible for a DNOD loan, and without such a loan none of the alternatives is feasible. To develop the site without the marina would require the use of general obligation bonds for funding, and there is every indication that it would be impossible to get the 2/3 voter approval necessary for such indebtedness.

E. FEWER OR MORE SLIPS

Setting the marina size - which is proposed to contain 492 slips - required balancing the projected demand, the revenues for repayment of the DNOD loans, and the construction costs.

The economic consultants have determined that "the demand for new boat berths along the East Bay waterfront is extremely strong. In total, over 3,000 new berths are needed by 1990. The City of Richmond is planning a large marina in the Inner Harbor which could eventually accommodate 1,700 boats. Smaller marinas or marina expansions are planned at other points on the Richmond shoreline, Emeryville, the Oakland-Alameda Estuary and San Leandro. Considering the tentative schedules for all known developments and the high increase in boat ownership, it is estimated that as many as 500 new boat berths could be occupied at Albany by the early 1980's".

The financial analysis of the project shows that the revenues from the rental of boat slips will amount to 63% of the total operating income to the City from the combined marina and commercial developments (Vol. 1, Table 17, p. 73). From this, it is apparent that a

significant reduction in the number of slips would seriously impair the City's ability to repay the DNOD construction loans.

Insofar as the possibility of reducing construction costs by reducing the number of slips, this is not a linear relationship. Certain major costs would apply even if there were fewer slips. These include: utility services to the marina area, the breakwater, the dikes at either side of the entrance, the tidal basin improvements, the harbormaster's facility, and most of the public amenities. Reducing the number of slips would significantly increase the cost per slip and adversely affect the project's feasibility. Adding slips to take advantage of the fixed costs would ignore the projections of demand and could result in empty slips.

F. NO NEW FILL FOR PARKING

The most controversial aspect of the development proposal has been the provision of new fill specifically to accommodate parking areas. This occurs only at the marina and at the launching ramp. In other locations, where parking is on new fill, the fill is required for different reasons and the areas created out of necessity are simply utilized for parking purposes.

In setting up a marina, consideration has to be given to maintaining a high occupancy rate to assure adequate revenues to pay off the construction loans. Boaters are no different from other automobile-dependent commercial recreation users. They are less inclined to patronize a facility where parking is inconvenient to their destination and, if the parking becomes too inconvenient, they will give up on the facility entirely. Because DNOD financing for the marina is essential to the feasibility of the total project, user appeal to assure consistent revenues has been designed into the facility.

Boater parking at the marina is provided on the main enclosure dikes at each side of the harbor. Parking is layed out in a 90 degree pattern on both sides of a central circulation road, with 130 spaces on each dike - which is at the rate of .53 parking spaces per slip. Additional space is provided for seven cars along the turnaround at each end of the main dikes as vista points for the non-boating public. If the boater parking were eliminated from the dikes, this would reduce the new fill only by about .9 acre, since roadways would still be required for security, firefighting and maintenance vehicles.

It has been suggested that "as an alternative to parking around the marina, ---- a loading facility be provided at the northern end of the marina allowing boaters to transfer their gear from car to boat. Automobiles could then be parked on the existing landfill in areas designated as parking sites. Through modification of the proposed plan, e.g., construct commercial facilities further north, parking sites could be placed closer to the marina (Carson for Smith, 1976)." Neglecting the impacts of placing the parking between the restaurants and the view or the removal of the marina-related commercial facilities from proximity to the marina, this suggested alternative would be both impractical and expensive.

On a busy day, it is reasonable to expect about one half of the boats to leave the harbor, and they would all leave within two hours and return within a similar period of time. The distance a boater would have to walk from the center of a drop-off parking area at the north end of the marina to his slip would be between 900 and 1,700 feet, or an average of 1,300 feet (1/4 mile). It would take a boater an average of about one hour to walk from his car to his slip, get his boat underway, bring his boat to a temporary mooring near his car, and load his gear into his boat. Since most of the activity would be during the middle of the two hour departure and return periods, and since the turnover rate would average one hour, sufficient parking

for most of the peak demand would have to be provided at the temporary loading area. In other words, the drop-off parking lot, which would be on new fill at the north end of the harbor, would have to be almost as large as the total amount of parking called for on the two main dikes. Since this would only be for drop-off parking, and since the parking indicated at the commercial area is minimal for that demand, another parking lot to handle 130 cars would have to be included on the existing fill. This proposal would have practically no effect on the amount of new fill required for parking, would greatly inconvenience the boaters (especially those at the more distant slips), would duplicate offensive parking areas on land assigned to park use, and would add substantially to costs. The most damaging effect of this scheme would be to discourage boaters from berthing at the Albany marina.

An extreme proposal for eliminating new fill for parking is simply to move the parking onto the existing fill and ignore the convenience of the boaters. Distances from car to slip would be even greater with accompanying unpleasantness for the potential slip occupant. The effect this would have on the occupancy rate would be devastating to the project's feasibility.

The alternative of locating the marina parking on the existing fill and providing mini-buses or electric carts to transport boaters to their respective gangways has merit, but would involve prohibitive expense for initial capital investment as well as for operating costs. Such service would have to be geared to peak demand and would be highly inefficient when only limited numbers of boaters are at the marina.

The parking lot for the launching ramp will be on new fill. As can be seen from Section 6, Plate 10, most of this fill is a buttress required to provide stability for the highest slope on the site. This fill is proposed to be approximately 23 feet further out from

the slope than is absolutely necessary to provide sufficient width for the launching ramp parking lot. The area for this additional width amounts to only about .2 acre. The problems which would be involved in locating this parking lot on top of the existing fill would be similar to those if parking is remote from the marina. Also, a parking lot on top of the existing fill in the vicinity of the launching ramp would be inaccessibly located about 25 feet above the ramp area, and it would pre-empt the choicest park space on the entire site.

G. SHEET PILING

Wood, steel or concrete sheet piling can be used to enclose a harbor or form a breakwater. However, earth and rubble dikes - as are proposed for this project - have many distinct advantages. They make it possible to have parking and restrooms within a reasonable distance from the slips, afford circulation to the gangways, provide recreation and viewing opportunities for the non-boating public, accept landscaping, and contain access roads for security, fire-fighting and maintenance purposes. Beyond all of the use considerations, the dikes provide the disposal containers for the initial construction dredge spoils. In addition, sheet piling would be so much more expensive to install as to make the project financially unattainable. This would be the case without even taking into account the added costs (or means) of accommodating parking, restrooms, access, and utilities.

Sheet piling, particularly for the breakwater and on either side of the entrance, would be least effective in dissipating wave energy and reducing reflections which will contribute to the build up of sand at the harbor entrance (Section 4B). Consequently, the use of sheet piling would require more frequent maintenance dredging and spoils disposal.

H. ROCK RIPRAP

The outer protective cover on all dikes is to be concrete rubble selected for size and appearance, with pieces ranging from 12 inches to 4 feet in size, and with reinforcing rods, pipes and other metal protrusions removed. This material was chosen because it will be readily available at minimum cost and the huge quantity involved makes these considerations very compelling. If quarry rock were used as an alternative for the riprap protection it would result in a significant adverse environmental impact at the quarry source, would require long distance truck transportation consuming large amounts of fuel, and would still leave the problem of disposing of great quantities of concrete rubble. The only advantage to the use of rock is aesthetic, and this would hardly justify its use for this project, especially since the select concrete rubble and rock would both take on a similar appearance with time.

I. REGIONAL TRAIL LOCATION

The alignment for the proposed north-south regional trail as it passes Golden Gate Fields would be limited to the top of the bluffs along that portion of the shoreline. Existing development and conflicts of use would pretty well prevent it from being located anywhere else between the Berkeley city limit and the landfill.

Extending that trail north of the landfill to the Richmond city limit is not quite as simple. On page 30 of VOLUME 1 there is a description of a proposed route which would follow Buchanan Street under the freeways and over the railroad tracks, and then head north along Cleveland Avenue to connect with the East Bay Regional Park District development at Point Isabel by way of Central Avenue. The principal advantage to this route is that it would have no impact on the marsh-mudflat area north of the landfill and along Hoffman Boulevard.

One alternative would be to place the northerly portion of the trail directly alongside Hoffman Boulevard. This would destroy much of the narrow strip of marsh along that shoreline, would interfere with the wildlife (particularly the shorebirds), and would bring the trail users right next to offensive freeway traffic. The advantage to this alignment is that the trail would be on Division of Highways right-of-way, if that could be arranged, minimizing or eliminating land acquisition costs.

Another alternative would be to carry the trail across the mudflat between the park area and Point Isabel on a pile-supported wood structure. This alternative is worthy of further consideration because of the dramatic experience it would offer the trail user and the obvious advantages for bird watching and fishing. Objections to this scheme are that it would intrude into a prime wildlife area, would cut across the view, would accelerate local sedimentation, would effectively reduce the surface of the Bay, and would be quite expensive to install and maintain.

PUBLIC AGENCY LIAISON

8. PUBLIC AGENCY LIAISON

During the time when the Albany Waterfront master plan was being formulated, communication was established and maintained with staff representatives of the numerous public agencies directly involved with the project. These ongoing contacts were extremely valuable in enabling the consultants to receive comments and suggestions on the various concepts as they evolved and in making it possible to consider and respond to the concerns of each agency. Listed below in chronological order are the key contacts made with the many agency staff members, with a brief description of what transpired. This does not include innumerable telephone conversations or other informal contacts. It should be noted that one or more members of the City of Albany staff were present at every meeting attended by the consultants.

A. December 10, 1975 - Meeting at BCDC.

Present: BCDC - Wilmar, Pendleton
Corps of Engineers - Boyle, Rawson
Albany - Turner, Guletz
Williams-Kuebelbeck - Gould
Environ - Bissell, Luckman

BCDC staff approach was that any plan which significantly differed from the Rimov Plan would negate the agreement between City and BCDC and would require BCDC permit. Both agencies expressed interest in avoiding further litigation. A marina would be an acceptable use. BCDC would be concerned about dredging and disposal of dredge spoils, as well as justification for any additional fill - whether required by the landfill or necessary to accomplish a proposed use. Reasonable to assume that problems relating to 1919 tidelands grant can be resolved. BCDC would probably not approve new fill for commercial facilities. Parking at shoreline undesirable, although may be necessary for

for marina requirements. This should be as little as possible, with minimum visual impact. Should try to achieve permanent public access along all of City's shoreline. Corps concerned about impact on restricted anchorage and navigation zones, spoils disposal and possibility of mudwaves affecting navigable waterways. Corps permit for further filling and dredging will require EIS. New law permits use of State EIR as basis for EIS. Unlikely that Corps will refuse to issue permit. Will balance opinions of other agencies, but if Fish and Wildlife object will have to be referred to Washington, and then full EIS process could take as much as 2 years.

B. December 17, 1975 - Meeting at City Hall.

Present: DNOD - Matsueda
Albany - Guletz
Williams-Kuebelbeck - Gould
Woodward-Clyde - Margason
Environ - Bissell, Luckman, Bickford

Reviewed areas of specific concern to DNOD. "Project area" will have to be defined with all funds necessary to make project feasible generated from that area. Revenues from slips alone often not enough and they have to be augmented by revenues from related commercial development. Discussed improvements for which DNOD funds could be used, construction scheduling and launching ramp grant considerations.

C. January 27, 1976 - Meeting at City Hall.

Present: DNOD - Matsueda
Albany - Guletz
Environ - Luckman, Bickford

The cost of the utilities and the access road from the present end of Buchanan Street to the INITIAL development area can

probably be included as part of the DNOD funded project. Concerned that City show its proposed financial participation (paths, landscaping, etc.).

D. January 30, 1976 - Meeting at BCDC.

Present: BCDC - Wilmar, Euston
Albany - Guletz
Environ - Luckman, Bickford

Showed rough sketch plan involving approximately 38 acres of additional fill. BCDC unlikely to approve such a proposal. Discussed alternative concepts including possibility of omitting marina.

E. January 19, 1976 - Letter from Foster of East Bay Municipal Utility District.

Information and maps on sewer and manholes.

Discusses capacity problems caused by stormwater entering sanitary system.

F. March 5, 1976 - Meeting at Environ.

Present: Fish and Game - Wooster
Fish and Wildlife Service - Breitenbach
Harvey, Hartesveldt, Heath & Stanley - Harvey
Albany - Guletz
Environ - Luckman, Bickford

Reviewed preliminary master plan. F&G concerned about circulation of bay water around south edge, would be interested in developing areas of firm sub-strata for clams and bait shellfish, and will be looking for long range dredge spoil disposal program. FWS would object to any fill for parking. New fill should be as small as possible. Discussion of invertebrate growth along new perimeter.

G. March 10, 1976 - Meeting at BCDC.

Present: BCDC - Pendleton, Breakstone
Albany - Guletz
Environ - Luckman, Bickford

Reviewed preliminary master plan. To be circulated for comments from other BCDC staff members. Discussion of damage if trail is extended north through marsh along Hoffman Boulevard.

H. March 22, 1976 - Letter from Carson for Smith of U.S. Fish and Wildlife Service.

Objected to proposed fill for marina parking and suggested loading facility with parking on existing fill (see Alternatives).

I. March 22, 1976 - Phone conversation between Guletz of Albany and Nichol of California Department of Housing and Community Development.

Informal advice on feasibility of redevelopment project at the project site.

J. March 23, 1976 - Meeting at California Regional Water Quality Control Board.

Present: SFWQCB - Dierker, Rial, Winnicki
Albany - Turner, Guletz
Woodward-Clyde - Margason, Hultgren
Environ - Luckman, Bickford

Reviewed preliminary master plan and the proposed cross sections around the fill. Tidal basin concept well received. Staff would support Corps approval for interim protective measures. Suggested coordination meeting with other agencies.

K. April 28, 1976 - Meeting at BCDC.

Present: BCDC - Pendleton, Breakstone, Tobin
Albany - Turner, Guletz, Reagan
Environ - Bissell, Luckman, Bickford

Reviewed BCDC staff comments on master plan. Report will have to justify all fill. Will want assurance that parking on new fill for marina is minimum. Commission will be concerned about park financing and its completion as part of project. Discussed engineering aspects of site improvements.

L. April 28, 1976 - Meeting at BCDC.

Present: BCDC - Pendleton, Breakstone, Tobin
SFWQCB - Rial, Winnicki
State Lands Commission - Horton, Fiack, Lindfeldt
Attorney General's Office - Krieger, Briscoe
Corps of Engineers - Boyle, Schleiaer
Fish and Game - Wooster
Fish and Wildlife Service - Breitenbach
Environmental Protection Agency - Vais
Albany - Turner, Guletz, Reagan
Woodward-Clyde - Margason
Williams-Kuebelbeck - McNichol
Environ - Bissell, Luckman, Bickford

Presentation of master plan, engineering and construction consideration, and financial feasibility. Corps outlined permit requirements and indicated that permission for interim protective measures could be obtained with minimum delay. SLC would like to see reasonable solution to current lawsuit such as proposed, and discussed support for new legislation to implement new firm plan. Each agency commented. F&G concerned about disposal of maintenance dredge spoils but not bothered by marina parking. FWS still opposed to fill for this parking even though alternatives may be "unreasonable from point of view of convenience and economics". EPA pointed out dredging information which will be required for EIS. SFWQCB see no serious problems. Tidal basin

is an improvement over usual harbor situation. BCDC impressed with reduction in fill from earlier plans and emphasis on public access. Some fill for water-oriented marina can be allowed. Reiterated concern about justification for fill and assurance that public use improvements will get built. Overall impression from group was favorable. Several comments about desire to resolve differences and how this proposal could be the vehicle.

M. May 28, 1976 - Meeting at East Bay Regional Park District.

Present: EBRPD - Kent
Albany - Guletz
Environ - Bissell, Bickford

Reviewed master plan. EBRPD interested in linking regional trail through area.

N. June 28, 1976 - Letter from Lew Crutcher, EBRPD, to Albany.

Commended the master plan. Expressed intention to develop regional trail through area but reservations about route shown.

ORGANIZATIONS AND INDIVIDUALS CONSULTED

9. ORGANIZATIONS AND INDIVIDUALS CONSULTED

Ashby, Raymond E., Commercial Representative, Santa Fe Land Improvement Company; discussions on December 9, 1975, March 2, 1976 and June 7, 1976.

Kerr, Kay and Gulick, Esther, Save San Francisco Bay Association; discussions on January 12, 1976 and March __, 1976.

Murphy, Richard J., Executive Vice-President and General Manager, Pacific Racing Association, Golden Gate Fields; discussion on June 7, 1976.

Save San Francisco Bay Association, Board of Directors; presentation on April 26, 1976.

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Woolworth, William, Chairman, Albany Waterfront Committee, November 20, 1975. Goals and Objectives letter to Albany City Council, Albany, California.

APPENDIX 1
ECOLOGICAL IMPACT

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ECOLOGICAL IMPACT OF THE ALBANY WATERFRONT MASTER PLAN

by the firm of

Harvey, Hartesveldt, Heath & Stanley, Inc.

April 1976

Submitted to Environ

716 GARNER COURT/ SANTA CLARA, CA. 95050 / 243-6956 / 277-3008

Introduction. The Albany shoreline constitutes a diverse assemblage of habitats ranging from a salt marsh and mudflats to concrete rubble. Although the entire shoreline was surveyed by our scientists (Dr. S. Webster, Invertebrate Zoologist; Dr. R. Hassur, Ichthyologist and Dr. H. T. Harvey, Ecologist) special attention was paid to the development areas of the marina, fishing pier, launching ramp, tidal basin and the peripheral fill to soften the abrupt shoreline areas, i.e. establish a more gradual slope.

The "old" shoreline areas along Hoffman Blvd. and immediately west of Golden Gate Fields are in a relatively natural condition and should be left undisturbed as indicated in the proposal. A small sand beach and upland sanddunes have developed at the north end of the shoreline west of Golden Gate Fields. Native plants have become established and with proper management this site may serve as a vignette of such a unique habitat. The mudflats west of the marsh along Hoffman Blvd. are a particularly valuable area for waterfowl and shorebirds as they are shallow, protected from the wind and apparently rich in food organisms. The designation of the area as a wildlife reserve is ecologically sound.

The present conditions of the fill areas and terrestrial strip along the shore west of Golden Gate Fields are of minimal wildlife value. This is due primarily to the limited vegetation which is present. Although a few native species are present, and a few vigorous weed plants thrive, the majority of the land area is relatively barren. The areas in question are either covered with roads or rubble. Thus it would not appear that any development on the terrestrial lands would adversely affect the flora and fauna of the site.

The propsed development at the five sites mentioned in the introductory paragraph present a mixture of impacts, which will be discussed in detail for each site. To determine present conditions in the marine environment that may be affected by the development, several sampling techniques were employed. Approximately 1,500 linear feet of shallow dredging was done around the western most peninsula to determine bottom fish and invertebrate fauna. Shore samples were taken in the lagoon and along the outer shoreline. Bottom grab samples were also taken to ascertain the bentic invertebrates in the sand and mud bottom adjacent to the present peninsula.

Marina. The development of the marina as presently planned

will have two primary effects, namely, an increase in shoreline length, and alteration of the sand-mud bottom currently characteristic of the marina site. The initial dredging will temporarily destroy the benthic invertebrates at the site.

The extension of the peninsula to accommodate the marina will probably increase sedimentation in adjacent protected areas. This increased sedimentation, particularly to the north, will lead to the potential of marsh development providing the mudflat surface achieves stability at a tidal level sufficient for cordgrass establishment. Although this may result in an apparent decrease in open water the addition of marsh would enhance the productivity of the Albany waterfront area which is at present minimal. An additional effect of the marina will be to create more calm water during winter storm winds from the northwest at the time of the year at which wintering waterfowl will find greater protection.

The increase in the linear dimension of the shoreline will substantially increase the available habitat for invertebrates characteristic of rocky shores. Specifically, the levees and breakwater should support bay mussels, barnacles, rock crabs and intertidal algae which are already present on the concrete rubble shoreline. These

organisms will in turn support a greater fish population. Those fishes known to be present are mainly sport species and will be identified under the discussion of the development impacts of the proposed fishing pier.

The quieter waters inside the marina probably will lead to the development of a fauna similar to that in the present lagoon, which is proposed to serve as a tidal basin. Sponges and oysters are likely to become established and add to the diversity of invertebrate species in the marina. Overall, the marina development will probably lead to a general increase in productivity and species diversity that should enhance the fisheries of the area.

Maintenance dredging activities in the marina basin, will have an inhibitory effect on invertebrate and algal colonization and growth inside the marina at the time of dredging and a short period afterwards. Intermittent dredging at several year intervals probably will cause little overall damage as marine forms of life rapidly colonize suitable substrates, i.e. within a few months after such dredging organisms should be back to near normal, as indicated by recent settling plate studies in the Oakland Estuary.

The discharge of water from the proposed basin can be managed so as to enhance flora and

fauna in the marina. The positive flow from the back of the marina to its entrance should help to purge oils and other pollutants from the marina waters. In addition if the outflow pipes are situated so that aeration is achieved during ebb tide the water trickling down the rip-rap at the back of the marina life in the marina will be aided. In addition the dilution effect of new water coming into the marina by controlled flow probably will decrease the likelihood of adverse effects of algal blooms because it should be relatively cooler and more oxygenated than residual marina waters.

The proposed location of the marina in the deepest water minimizes impact in contrast to alternative marina sites in shallower water. Intertidal sites are generally richer in wildlife values than subtidal sites such as the proposed marina site.

In summary, the marina development will displace the present rather meager flora and fauna of the bay bottom with a more diverse and more abundant flora and fauna. This is in large part due to two major factors: increase in linear shoreline and increase in diversity of micro-habitats. The latter includes differences between inner and outer levee surfaces and calmer warmer waters within the marina basin versus agitated waters on the outside.

In addition, the flow of water from the tidal basin should improve water quality in the marina over what it would be without it.

Launching Ramp Area. The silt bottom of this area supports a modest benthic invertebrate fauna similar to vast areas in the Bay. The impact of its loss is minimal, provided it is the last such loss for the Albany Waterfront. The new shoreline created by shoreline levees will soon duplicate the existing shoreline in providing a substrate for algae and invertebrates that in turn will support fish and birds.

Efforts should be made to minimize the sedimentation adjacent to this fill by reducing erosion from the adjacent land. Deposition of fine material around the peninsula will probably continue but efforts to seal off the flow from the peninsula will benefit benthic organisms. The present situation seems to be one in which only the most anaerobic forms can tolerate the continued deposition of mud.

Fishing Pier. The fishing pier appears to be located in a near optimum site so that tidal, wave and current action are maximal. The pilings should soon be colonized by

algae and a variety of invertebrate animals, which will in turn attract the typical pile associated fish.

To augment and improve the fishing potential at the pier we recommend the construction of auto tire artificial reefs about 100 yards around the pier and adjacent shores. Such reefs would increase diversity of potential food organisms and thus attract and hold large sport fish in the area. Being constructed of rubber tires, and if anchored below MLLW, they would not constitute a navigational hazard, (see references at end of report).

The fishes that were found to occupy the waters around the peninsula were as follows:

Sport Fish	Other Fish
Jack smelt	Staghorn sculpin
Striped bass	Pacific herring
Pile perch	Northern anchovy
Starry flounder	Brown rockfish
Leopard shark	Surf smelt
Dogfish shark	Long-finned smelt
Bat ray	

The "other fish" list above are often part of the food chain that supports the sport fish. It is expected that all of these and others would be enhanced in number and size by increasing the substrate for algae and invertebrates through increased shoreline and/or artificial reefs.

Tidal Basin. At present the tidal basin (or Lagoon) is relatively calm water with little tidal fluctuation. Increased tidal changes and turnover rates for the water will reduce water temperature in the lagoon. Large branching colonies of the sponge (Haliclona sp.) will be reduced. The same trend will probably affect the oyster (Ostrea lurida). Other species, however, will move in and thus diversity and total productivity will likely increase. This basin is most likely to develop into a fishing area of greater value than at present, but may be limited by higher temperatures than the adjacent open bay when developed.

Peripheral Fill Around Peninsula. The additional fill at the margin of the present peninsula will have minimal impact. The material will cover the present meager benthos. Colonization by algae and invertebrates of the new rip-rap should occur within a few months. A more gradual slope than at present will increase the surface area of the intertidal zone. This will result in a proportionally greater biomass of algae and invertebrates which in turn should support more fish and birds than currently feed in the area.

Consideration should be given to minimize run off of

material from the land fill and intentional irregularity of the shoreline would enhance wildlife values by creating more surface and sheltered embayments. Continued sedimentation induces anaerobic conditions, therefore sealing of the present fill would be desirable in order to reduce this effect.

Summary. Overall the proposed development would increase the rocky intertidal zone with its concommittant increase in productivity and wildlife values. Negative impacts include destruction of a relatively few benthic organisms and the disturbance due to construction and dredging. The addition of buildings and parking lots on the terrestrial area would have an insignificant impact on the flora and fauna as little of importance exists there at present. The development of a park would increase the wildlife values of the proposed site. Thus, on balance, the ecological benefits outweigh the losses.

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